

THE PEDDLING PERIL INDEX (PPI) 2019/2020

THE FIRST RANKING OF NATIONAL STRATEGIC
TRADE CONTROL SYSTEMS

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INSTITUTE FOR SCIENCE AND INTERNATIONAL SECURITY
MAY 2019

Institute for Science and International Security

The Institute for Science and International Security is a non-profit, non-partisan institution dedicated to informing the public about science and policy issues affecting international security. Its primary focus is on stopping the spread of nuclear weapons and related technology to additional nations and to terrorists, bringing about greater transparency of nuclear activities worldwide, strengthening the international non-proliferation regime, and achieving deep cuts in nuclear arsenals.

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Institute for Science and International Security Press

440 1st Street NW
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Washington, DC 20001
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www.isis-online.org
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Library of Congress Control Number: 2019946349

ISBN-13: 9781079527025

Cover design: Stewart A. Williams Design

Dedicated to all those who strive to stop the spread of nuclear weapons and the wherewithal to make them.

CREDITS AND ACKNOWLEDGEMENTS

The *Peddling Peril Index* (PPI) project is a result of hundreds, if not thousands, of hours of data collection, research, and analysis by Institute for Science and International Security staff, past and present. The 2017 version credits those past staff members and consultants who contributed importantly to the first version of the index. We wish to thank Hanah Joudi, Ramya Ramjee, Claire Chopin, Bridget Leahy, Naomi Silverstein, Maximilian Lim, and Bernadette Gostelow for their research and contributions to the 2019 update. We also thank Richard Cupitt for his consultations on statistical analysis for this update, and Anna Lea Albright for performing the cluster analysis. Finally, we are grateful to all those who wish to remain anonymous that contributed to improving the PPI.

The PPI project grew out of more than two decades of work by the Institute on understanding and characterizing illicit nuclear and other strategic commodity trafficking. A 2010 book, *Peddling Peril*, by Institute founder and president David Albright, furthered this work and is the project's namesake.

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PREFACE TO THE 2019 PPI

A critical strategy to stop Iran's and North Korea's dangerous nuclear endeavors is thwarting their ability to acquire goods needed to build nuclear weapons and other weapons of mass destruction (WMD) and the means to deliver them. Case studies, many of which the Institute has published on its web site, have shown that countries seeking nuclear weapons capabilities have depended on acquisition from abroad of a wide range of critical know-how, raw materials, equipment, and components.

Since the creation of the Nuclear Non-Proliferation Treaty (NPT) in 1968,¹ one case after another, from Pakistan to India, Taiwan to North Korea, Iraq to Iran, Argentina to Brazil, and South Africa have shown that almost all countries that have sought nuclear weapons face an essential challenge in that they cannot produce all that they need domestically or afford to create the indigenous industrial wherewithal to make the thousands of required goods. For example, the dangerous nuclear programs of Iran and North Korea would have ground to a halt without access to goods from abroad.

Strategic trade controls have developed into a critical countermeasure against trafficking in nuclear, missile, WMD, and military-related commodities. Although no one tool can completely stop determined countries like Iran and North Korea from acquiring illicitly the goods they seek, strategic trade controls have proven important in slowing and complicating those efforts. They have also stimulated and provided tools to responsible nations for better and earlier detection of secret efforts to create, for example, the most worrisome nuclear weapons capabilities,

particularly those in regions of tension such as the Middle East, South Asia, and Northeast Asia. By detecting these programs earlier and causing delays, strategic trade control systems have provided more time for diplomacy and other counter-proliferation tools to seek solutions to the fundamental problem of nuclear and other types of proliferation.

Today, strategic trade control laws are well implemented in supplier countries. For example, the Nuclear Suppliers Group (NSG) has established a wide range of norms and principles over several decades for its members, as well as extensive control lists of equipment, materials, and technology relevant to nuclear proliferation. However, cases of nuclear commodity trafficking show that some NSG countries implement and enforce their laws far better than other members. Moreover, about three quarters of all countries and territories are not members of the NSG. These non-NSG states often have far weaker strategic trade control laws, or none at all.

In response to the enactment and improvement of trade controls, states whose aim it is to acquire or maintain weapons of mass destruction have developed increasingly sophisticated national and transnational networks to acquire goods illicitly for covert, unsafeguarded, or sanctioned nuclear programs, as well as missile, other WMD, and military efforts. Thus, supplier states need to continually improve their strategic trade controls to counter these steps. Moreover, case studies of illicit procurement make clear that it is not enough for just a few countries to have adequate controls over the export of key goods. In fact, Iran, North Korea, and others often base their efforts in countries with less effective controls as they seek to acquire goods from countries with advanced technological sectors, such as the United States and Germany. They often declare a false end-user and transship and finance the purchase of goods through other countries that also have less effective or nonexistent controls. These “pariah” countries, in essence, look for the weak links in the fabric or net of international strategic trade controls. Experience teaches that they find many opportunities to bypass controls or sanctions.

These issues arose at a 2015 Institute for Science and International Security workshop involving a unique range of law enforcement officials, Congressional staff, and non-governmental experts. These experts could not agree on how to better target efforts to prevent the spread of strategic commodities and gauge weak links in the fabric of global trade controls.

There was agreement that there is little chance of thwarting strategic commodity trafficking efforts without knowing the sufficiency of trade control systems around the world. Participants concluded that there was a deep need for a better way to evaluate trade control systems worldwide, and thereby establish a basis from which policymakers could mitigate gaps and develop counter-proliferation initiatives. The *Peddling Peril Index* (PPI) was envisioned at this workshop as a way to help do this. At the workshop, this name was recommended as a follow-on to Albright's 2010 book, *Peddling Peril*, on illicit nuclear trade and the A.Q. Khan network that operated out of Pakistan.² As the project developed, it became clear that an annual or semi-annual review was necessary to measure progress.

In this endeavor to thwart commodity trafficking and bolster strategic trade controls, the passage of 2004 United Nations Security Council resolution (UNSCR) 1540 was an important milestone. It recognized the need for all nations to put in place appropriate, effective trade controls to prevent the spread of the wherewithal to make weapons of mass destruction. Yet, the resolution today remains under-implemented and levels of state compliance are irregularly reported.

UNSCR 2325, passed in late 2016, lays out many steps and actions for addressing these shortcomings. It also highlights the need for more attention to enforcement, counter-proliferation financing measures, and transshipment controls. Issues raised in case studies in these three areas were originally a principal motivation for the PPI.

Nonetheless, there remains no measure that mandates the evaluation of the effectiveness of national strategic trade controls on a global scale or the creation of a body to perform independent evaluations. This is where the PPI steps in. The PPI ranks 200 countries, territories, and entities according to their adoption and implementation of strategic trade controls and assesses how well those systems are performing at preventing the trafficking in nuclear and other strategic commodities.³ The ranking is derived from numerous indicators pertinent to strategic trade controls and non-proliferation. The PPI's data and analysis allow for comprehensive, straightforward assessments that help to better characterize the sufficiency of strategic trade control systems and other globally-recognized best practices for implementing and maximizing the performance of strategic trade control systems.

This second version of the index builds upon and updates the first version. It encompasses information gathered during 2017 and 2018. Section I includes information on the index's development, methodology, data, and scoring. Section II provides what the project views as the key rankings of countries in the index.

The PPI measures the effectiveness of strategic trade controls using a set of criteria relating to a country's existing laws, regulations, procedures, practices, international obligations, and actions. Its fundamental purpose is to identify in a measurable manner the relative strengths and weaknesses of national strategic trade control systems throughout the world.

The results are presented in multiple ways. Key rankings in the index are given by grouping countries into three distinct tiers, each of which represents countries that are alike in their supply potential, economic development, and other measures. The usefulness of this type of approach was recognized in UNSCR 2325, when it urged the 1540 Committee, in its work, to take into account "the specificity of States, *inter alia*, with respect to their ability to manufacture and export related materials, with a view to prioritizing efforts and resources where they are most needed without affecting the need for comprehensive implementation of resolution 1540." In brief, Tier One in the PPI includes those nations that can supply, at least partially but significantly, the wherewithal to make nuclear weapons, other WMD, or the means to deliver them. Tier Two includes countries of transshipment concern, and Tier Three includes the remainder of the countries.

We also include a cluster analysis in this version. This statistical approach divides countries by score into four groups. It allows for quick determination of a country's placement in a high or low-scoring group (or a group in-between), and for easy cross-country comparisons.

Finally, Annex 1 to this update provides a full ranking and lists scores for all 200 countries, territories, and entities. Annex 2 lists the countries in each of the four clusters.

The 2017 version contained a lengthy Recommendations section, and a section that assesses and compares countries in special groupings or applications of interest to the project, and likely to many readers. We have omitted these sections from the 2019 edition and only feature a subset of recommendations. We advise interested readers to explore Sections III and IV in the 2017 version, as well as the PPI webpage on our website,

which features additional PPI applications created as external reports.⁴ We plan to publish a separate report detailing recommendations; in this version, the recommendations are limited to those most pressing or related to the PPI itself.

In many ways, the 2019 PPI applies higher standards than the 2017 edition and strengthens the assessment. It evaluates 101 indicators, and features dozens of new data sources. This includes 19 new trade control indicators, addressing areas previously not included, such as customs checks in Free Trade Zones, interagency cooperation, and government oversight. It was stripped of redundant criteria, and some criteria were revised to better assess performance. In this version, we have highlighted new indicators and explained in footnotes the reason or logic for the discontinuance of others.

Nonetheless, we recognize that with the currently available information, the PPI can only be a rough measure of strengths and weaknesses of national strategic trade control systems. In addition, we have weighted various factors to construct an overall index and recognize that different observers may choose different weights.

We offer this second version of the *Peddling Peril Index* with optimism that it has improved upon the 2017 version. We are thankful for the positive reception to the first version and to those who took the time to share their comments and recommendations. We were pleased that several governments reached out to share additional information for this update and to learn more about how they could improve their strategic trade control implementation. As in the previous version, it is our hope that the PPI will be valuable to states, organizations, researchers, and the general public. We aspire for it to motivate strengthened strategic trade control efforts worldwide and reduce the chances that additional states or non-state actors will obtain the wherewithal to fabricate nuclear and other destructive weapons. The printed version is available only in black and white. A color version is available as an e-book on Kindle and as a pdf at www.isis-online.org/ppi.

NOTES

1. Countries seeking nuclear weapons prior to the signature of the Nuclear Non-Proliferation Treaty depended on imports for their nuclear weapons efforts, but at that time, there were few laws controlling such trade.
2. David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America's Enemies* (New York: Free Press, 2010).
3. A shortened United Nations-derived name for each country is used throughout the report. We also use an abbreviated name for non-UN recognized territories or provinces.
4. See: *Peddling Peril Index*, Institute for Science and International Security, <http://www.isis-online.org/ppi>

HIGHLIGHTS

Figure I.1 is a pictorial representation of the Peddling Peril Index's scores for each country, territory, or entity. Dark blue represents higher scores and light blue represents lower scores. In general, the scores in the northern hemisphere were higher than in the southern hemisphere, and developed nations scored higher than developing countries.

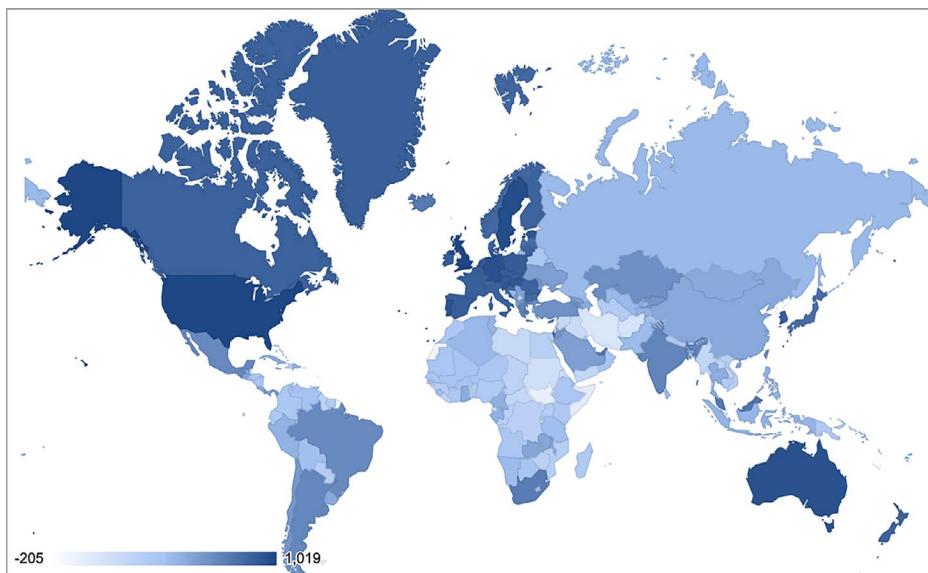


Figure I.1. The PPI scores represented by country,
where darker blue indicates a higher score.

Countries could receive a total of 1,300 points. Their scores improved, on average, by two points from the last PPI edition. Given that a stricter evaluation approach was taken, this increase is a positive development.

Figure I.2 shows that scores varied between about -200 and 1,000, meaning that no country received more than 80 percent of the possible points, and a few countries did poorly. The figure also shows that the score distribution is fundamentally bimodal in shape, as in the previous ranking.

2019 Total PPI Point Distribution

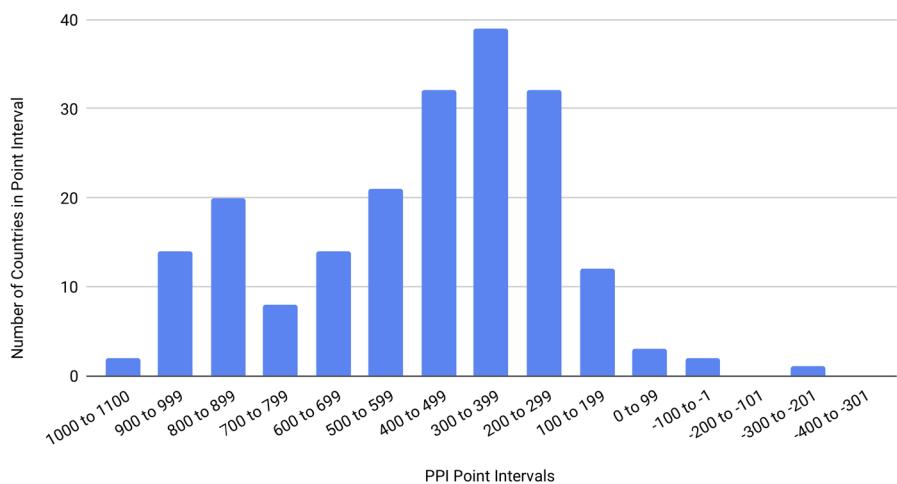


Figure I.2. Distribution of total points in intervals of 100 points.

Much like the 2017 PPI, the 2019 update found that only a fraction of the world's national trade control systems received more than 50 percent of the available points. Twenty-nine countries achieved two-thirds or more of the available points, and an additional 21 countries achieved more than half but less than two-thirds of the possible points. However, the remaining 150 of the 200 evaluated countries received less than half of the available points. Ninety-six countries received less than one-third of the total points. Given the unstoppable pace of globalization and the central importance of strategic trade controls in stopping proliferation, this wide range of performance is alarming.

A deeper look into the scoring reveals several reasons for the many relatively low scores. The 2019 PPI uses 101 indicators to calculate a final score, which are categorized into five pillars of strategic trade controls:

1. **International Commitment** to preventing strategic commodity trafficking;
2. **Legislation** in place that regulates and oversees trade in strategic commodities, and criminalizes and aims to prevent strategic commodity trafficking;
3. **Ability to Monitor and Detect Strategic Trade;**
4. **Ability to Prevent Proliferation Financing;** and
5. **Adequacy of Enforcement** against strategic commodity trafficking.

Proliferation financing has not typically been considered when debating the efficacy of strategic trade controls. However, the PPI finds that it should be a central part of any such deliberations.

Average scores for all countries together were highest in *Legislation*, closely followed by *International Commitment*, and lowest in *Ability to Prevent Proliferation Financing*. Yet, only 56 percent of the possible points are collectively achieved under *Legislation*. This number drops to 50 percent in *International Commitment*; 40 percent in *Ability to Monitor and Detect Strategic Trade*; 33 percent in *Adequacy of Enforcement*; and 16 percent in *Ability to Prevent Proliferation Financing*. Figure I.3 shows this global result for all countries, where a stacked blue and red bar represents the total points available in each super criterion, after weighting. The blue portion represents the achieved points by all countries, and the red bar shows the missing points. As can be seen, the *Proliferation Financing* and *Enforcement* super criteria are the most heavily weighted in this analysis, and the super criteria missing the most points.

HIGHLIGHTS

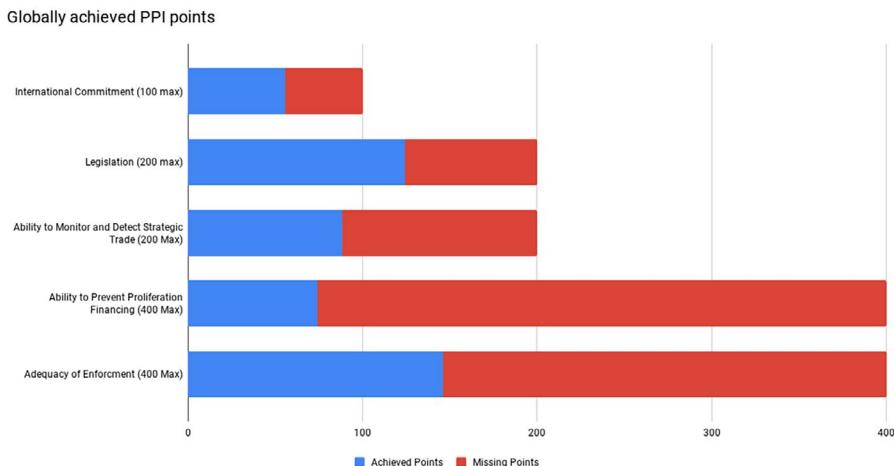


Figure I.3. Collective average scores for all countries by super criteria.

Beyond the scores, the PPI found that under the *Legislation* super criterion, which examines national laws on import, export, transit and trans-shipment controls separately, only 74 countries have export control legislation with the desired comprehensiveness in place, covering exports of nuclear direct and dual-use items. That means the majority of countries do not have adequate strategic trade control legislation in place, regardless of how well it is implemented. Figure I.4 is a map that is color-coded by comprehensiveness of export control legislation, where dark green is most comprehensive and red is least comprehensive. As can be seen, the red is concentrated in the southern hemisphere.

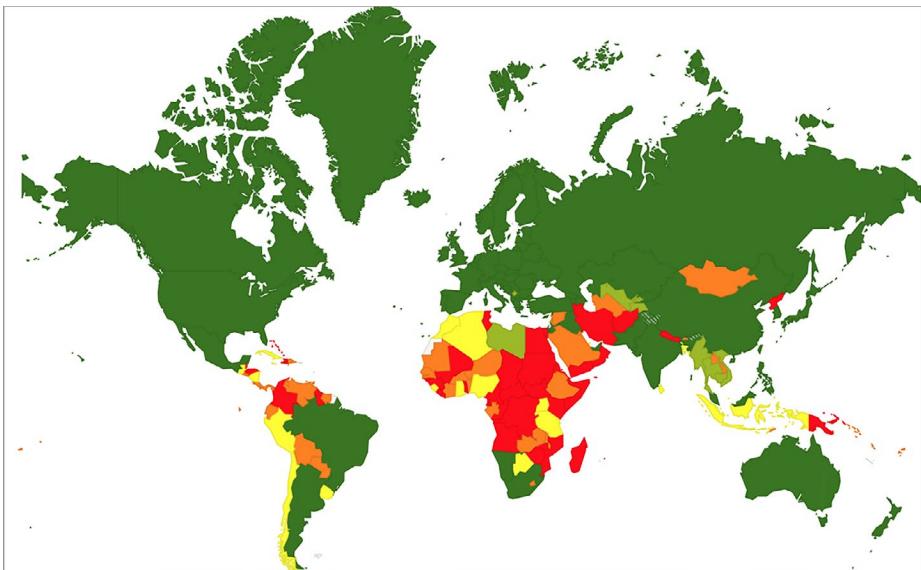


Figure I.4. Color coding of the comprehensiveness of export control legislation, where comprehensiveness is measured from most comprehensive to least in dark green, light green, yellow, orange, and red, respectively.

To make more realistic country comparisons, the full ranking is also divided into three distinct sets of countries, termed “tiers,” as discussed above. The three tiers are organized based on such criteria as their potential for supplying strategic commodities and their likelihood of being exploited by illicit procurement networks as transshipment points. In brief, as discussed in more detail later, Tier One in the PPI includes those nations that can supply, at least partially but significantly, the wherewithal to make nuclear weapons, other WMD, or the means to deliver them. Tier Two includes countries of transshipment concern, and Tier Three includes the remainder of the countries. Figure I.5 shows the average scores for the three tiers. Tier One scores are, on average, considerably higher than the scores achieved by countries in Tiers Two and Three. The bi-modal shape of the score distribution in Figure I.2 can be explained to first order by the difference in the average scores in the tiers.

2019 Average and Median Scores

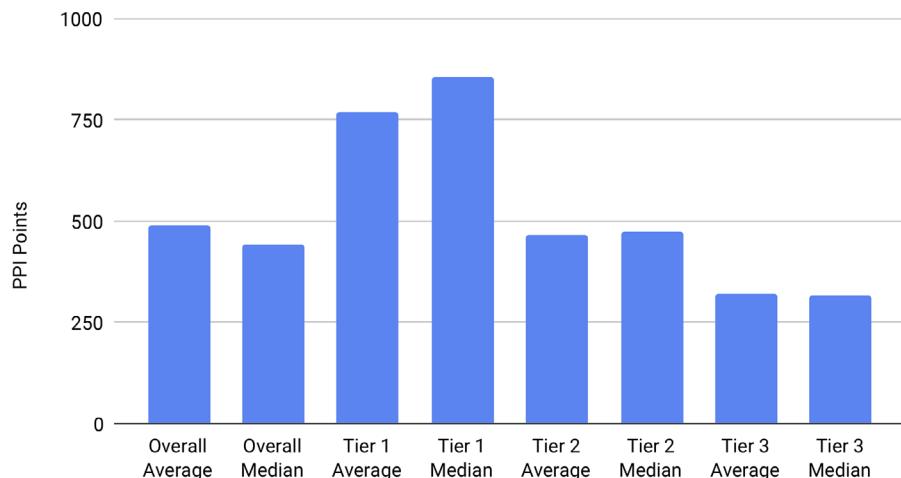


Figure I.5. Average and median scores for the overall PPI and the three tiers.

The overall average is 489 points and the overall median is 443 points. As can be seen, Tier One did considerably better than Tiers Two and Three.

A natural question is how the scores relate to discussions about the effectiveness of national strategic trade control systems. This question is complicated by the need to constantly counter more sophisticated efforts to thwart trade controls and sanctions, which necessarily involves improving controls, even in the highest-scoring countries. However, within that context, countries also need to know if they are on the right track.

To address this set of issues, the PPI decided to identify relatively high-scoring countries which have a strategic trade control system score above a certain point cutoff. The cutoff was weighted toward realistic expectations of the tiers. It was selected at two-thirds of the total points for Tier One countries and one-half for Tiers Two and Three. In Tier One, 27 out of 55 countries achieved over two-thirds of the points, and in Tier Two, six countries out of 61 achieved over half of the total points. In Tier 3, none of the 84 countries met the cutoff of fifty percent. In total, 33 out of 200 countries, or 16.5 percent, satisfied these cutoffs. Table I.1 lists the countries in this group, along with their tier. Table I.2 lists all the countries that scored above 50 percent.

How to choose and characterize these initial cutoffs was intensely debated by the PPI team. It was decided that these levels do not measure

adequacy of strategic trade controls but simply serve to highlight the highest-scoring countries, which includes key countries in improving and implementing strategic trade controls. This placement in the leading-score group also does not mean that these countries' trade control systems do not need improving or are somehow free of significant gaps. The overall scores do not support that view.

Many other countries with scores lower than those of this high-scoring group are on the right track. However, some countries that scored relatively low likely need significant improvement, and on an expedited basis. For those few countries that fall at the very bottom of the scoring, supplier countries need to exercise extreme caution or in some cases deploy avoidance and isolation of trade strategies.

Table I.1. Thirty-three high-scoring countries, based on cutoffs in scores, listed alphabetically and by tier.

LEADING-SCORE COUNTRIES BASED ON CUTOFFS IN SCORES	
Tier One (scores met or exceeded two-thirds of the total points)	
Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, New Zealand, Poland, Portugal, Republic of Korea, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom of Great Britain and Northern Ireland, United States of America	
Tier Two (scores met or exceeded half of the total points)	
Cyprus, Malaysia*, Malta, Moldova (Rep of the), Singapore*, United Arab Emirates	
<small>*In an Institute analysis of the March 2019 Panel of Experts report to the UNSC Resolution 1718 (2006) Sanctions Committee on North Korea, as well as in Institute analyses of previous Panel of Expert reports, Singapore and Malaysia appear to be repeatedly involved in an unusually large number of sanctions violations. This will be considered in future PPI versions.</small>	

HIGHLIGHTS

Table I.2. The top 50 scoring countries in the PPI, all of which achieved more than half of the available points, listed by rank and score.

COUNTRIES THAT RECEIVED MORE THAN HALF OF THE AVAILABLE POINTS		
Rank	Country	Points (out of 1,300)
1	United States of America	1019
2	UK (Great Britain & Northern Ireland)	1018
3	Sweden	987
4	Germany	969
5	Australia	966
6	Singapore	959
7	Portugal	950
8	Hungary	942
9	Estonia	940
10	Austria	927
11	Netherlands	926
12	Slovenia	924
13	Czech Republic	912
14	Poland	910
15	Ireland	908
16	Spain	904
17	Republic of Korea	897
18	Belgium	897
19	Slovakia	896
20	France	896
21	Denmark	894
22	Italy	884
23	Canada	883
24	New Zealand	882
25	Lithuania	882
26	Romania	876
27	Finland	876
28	Malta	873
29	Luxembourg	871
30	Croatia	857
31	Switzerland	854
32	Norway	854
33	Bulgaria	845
34	Latvia	823
35	Israel	821
36	Japan	818
37	Cyprus	795
38	United Arab Emirates	783
39	Malaysia	774
40	Iceland	759
41	South Africa	749
42	Greece	718
43	India	713
44	Argentina	704
45	Mexico	691
46	Brazil	688
47	Taiwan	677
48	Kazakhstan	657
49	Moldova (Rep of the)	652
50	Turkey	650

Despite emphasizing tiers, this edition of the PPI also includes a “cluster analysis” of the scores and ranks. The goal is to better understand the structure of the scores. In essence, this statistical method groups scores around a set of relative peaks in the scores, which in this case numbered four. This method allows for a more effective look at the structure of the scores than the simple bimodal analysis conveyed in Figure I.5.

Figure I.6 shows the results of the cluster analysis. Cluster 1 (Group 1) includes the ranks 1 to 41; Cluster 2 (Group 2) includes the ranks 42 to 96; Cluster 3 (Group 3) includes the ranks 97 to 168; and Cluster 4 (Group 4) includes the ranks 169 to 200. It is noticeable that Group 3 includes 72 countries, which is more than any of the other groups. Group 1 has 41 countries; Group 2 has 55 countries; and Group 4 has 32 countries. The countries in each cluster are listed in Annex 2.

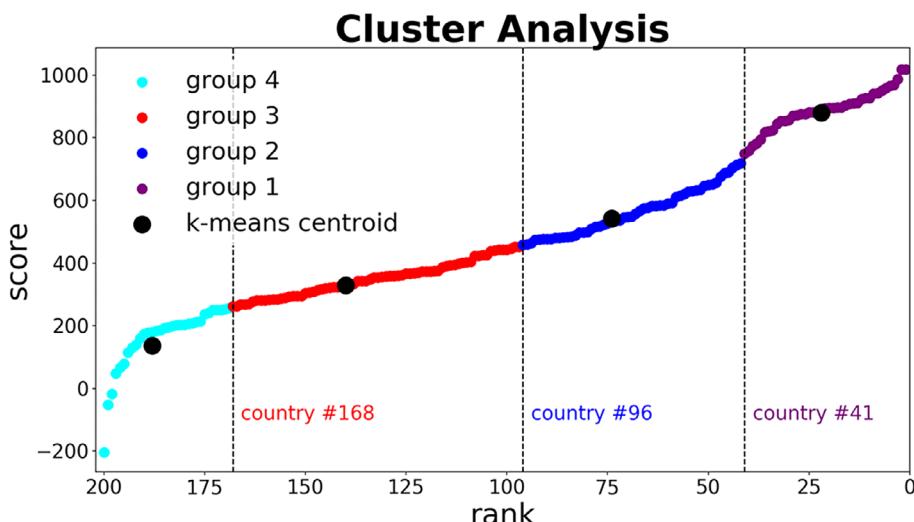


Figure I.6. The 2019 PPI countries plotted by rank and score clustered into four groups.

A key value in each cluster is its “centroid,” or mean, identified as “k-means centroid” in Figure I.6. Group 1 has a mean of 879 points; Group 2 has a mean of 542 points; Group 3 has a mean of 330 points; and Group 4 has a mean of 136 points (see Chapter 7). The corresponding score ranges are 1,019 to 749 for Cluster 1, 718 to 458 for Cluster 2, 452 to 262 for Cluster 3, and 257 to negative 205 for Cluster 4.

Of the 41 members of Cluster 1, the highest-scoring cluster, 36 are Tier One countries. Twenty-seven of these 36 Tier One countries are leading-score countries as listed in Table I.1. The five remaining members in Cluster 1 are Tier Two countries, all of which are leading scorers (see Table I.1). Cluster 2 has 55 members, and is comprised of a mix of 14 Tier One, 28 Tier Two, and 13 Tier Three countries. One Tier Two country met the cutoff score of its tier (50 percent of the total points) to be considered a leading-score country in this cluster. Eight of the 14 Tier One

countries also received 50 percent or more of the points, but the score cutoff to be considered a high-scoring country in Tier One is two-thirds of the total points. Clusters 3 and 4 have 72 and 32 members, respectively, none of which are listed in Table I.1 as high-scoring countries. In Cluster 3, three countries are Tier One, 21 are Tier Two, and 48 are Tier Three. Cluster 4 is comprised of two Tier One, seven Tier Two, and 23 Tier Three countries. The Tier One countries in Cluster 4 are Iran and North Korea.

In an ideal world, there would only be one, high-scoring cluster. At least, the cluster with the most countries in it would be the highest-scoring cluster, and not, as is currently the case, Cluster 3, where the mean score is only 330 points, or 25 percent of the total points. As strategic trade controls gradually improve, and PPI scores rise, we hope to see low-scoring clusters shrink in size in future PPI editions. Although uncertainties should be borne in mind, placement in the first and second clusters represents possession of more effective strategic trade controls than placement in the third and fourth clusters.

PPI AS A TOOL FOR IMPROVEMENT

The PPI provides a way for states to reflect on their own trade control systems and compare their performance to other countries. Because a central finding is that all countries need to improve their scores, the scoring stands as a reminder against complacency by all, including trade control officials, national decision makers, and budgetary authorities.

The PPI can help assistance-offering countries to identify countries or regions to focus on. It can help identify strengths and weaknesses of a country's system, which can be used further to identify countries that need assistance and the type that would be most beneficial. Importantly, the PPI not only looks at the existence and enforcement of strategic trade controls, but also at the general environment in which controls are implemented. Therefore, among countries that do not yet have strategic trade control legislation in place, the PPI score, rank, and country-profile offer an evaluation of the *foundation* upon which strategic trade controls can be built. The PPI can also supplement country need assessments performed by assistance-offering countries. The evolution of a country's score and rank through updates of the PPI can be used by assistance-giving countries as an objective way to monitor progress and measure success.

HOW TO IMPROVE A PPI SCORE

A natural question is how a country can improve its scores. This entails fulfilling many of the criteria or indicators that the project has determined to be of importance. If a country is interested, we would be happy to provide its points profile and information that led to it, and consult with relevant representatives for a follow-up report. We encourage interested countries to contact us. We also welcome comments and reactions to the rankings.

With 89 positive, point-earning criteria and 1,300 possible points, a single criterion cannot “make or break” a country. Rather, the final PPI scores indicate that creating an effective strategic trade control system relies on many actions, large and small, in several areas. Nonetheless, focusing on improvement or implementation of 23 “high-impact” indicators defined in the following chapters, some from each super criterion, lays out a strategy for improving a country’s strategic trade control performance.

Moreover, despite overall low performance in *Ability to Prevent Proliferation Financing*, this area offers great rank improvement opportunities for individual countries while also providing a path to improved trade control implementation. Together with *Enforcement*, it is one of two more heavily-weighted areas in the PPI. A path to better performance is closely tied to working with the Financial Action Task Force (FATF). From 2017 to 2019, 48 countries increased their score under *Ability to Prevent Proliferation Financing* through improved compliance with FATF standards. There are many other international organizations, such as the World Customs Organization, with which countries should work more closely on trade control implementation and from which they should seek assistance. Working to implement the trade control provisions of UNSCR 1540 (2004) would also boost a country’s score.

KEY RECOMMENDATIONS

We end this section by highlighting a few recommendations. For a fuller discussion, we refer the reader to Section III of the PPI for 2017.

Overall, the state of strategic trade controls is not adequate. A priority should be developing and maintaining effective national strategic trade control systems throughout the world. An increasingly important part of that is sanctions implementation and enforcement.

A key recommendation remains that strategic commodity trafficking should not have any safe havens. All countries should have, at a minimum, the legal authority necessary to control the export, re-export, transit, and transshipment of proliferation-sensitive items or transfer of those items to proliferation-linked end-users.

All countries should also have the capability to implement and enforce sanctions required by UN Security Council resolutions. Recent reporting by the United Nations of numerous violations of UNSC sanctions against North Korea show that this is a critical area for improvement.

There has been little progress on establishing an international mechanism to evaluate the effectiveness of strategic trade controls. Toward that goal, states should provide a mandate to an organization or organizations to conduct trade control evaluations that states could participate in on a voluntary basis. This body could develop model adequate strategic trade control systems and a handbook on how to improve the implementation and enforcement of trade controls. The models and handbook should contain specific information geared to the general level of industrial and nuclear development of different states. The development of a team outreach effort could evolve into a body conducting mutual evaluation reports, similar to those done by FATF, on the status of countries' strategic trade control systems, based on a set of criteria. Such reports could make judgments about the sufficiency or status of states' compliance with best trade control practices.

Supplier states should certainly consider additional assistance and incentive programs. Unless strategic trade controls improve, however, suppliers and major transshipment nations should also consider penalties, from extra licensing requirements to sanctions, for those countries that both pose a risk to their trade control systems and lack even minimally effective controls.

SECTION I

PEDDLING PERIL INDEX METHODOLOGY

CHAPTER 1

INTRODUCTION TO THE METHODOLOGY

At the core of the *Peddling Peril Index* is an evaluation of a set of criteria designed to measure the extent and performance of strategic trade controls in 200 nations, territories, and entities. The goal of the PPI is to determine not just the existence of strategic trade controls but also the extent of their implementation and enforcement. This endeavor is weighted toward nuclear and nuclear-related trade controls, but factors in other forms of trade controls, such as those covering strategic commodities relevant to the development of missiles, non-nuclear weapons of mass destruction (WMD), and conventional military programs.

A central purpose of the PPI is to provide guidance for efforts to improve states' strategic trade control systems and aid in capacity building efforts. The PPI also provides an indication of a state's vulnerability to illicit procurement schemes and measures the extent of a country's compliance with international obligations, such as UN Security Council Resolution 1540.

In the first phase of the 18-month development of the 2017 PPI, about 150 sub-criteria (or indicators) in 13 major categories (later titled "super criteria") were identified. A goal was to identify criteria that provide simple answers and are quantifiable, since the PPI assigns points to determine rankings. Another goal was to maximize the use of open-source data and minimize the use of expert judgment, which can be subjective, although

this was not possible to do completely, as will be discussed in subsequent chapters.

A priority was not to model criteria used in the U.S. trade control system, but to look more broadly and with an open mind at trade controls in a wide variety of countries. Many countries do not have trade controls that are as extensive as the United States' but still have effective systems targeted to their level of international trade engagement or nascent systems that could support the development of effective strategic trade controls in the future, when they are more needed.

An early challenge in the 2017 project, and re-addressed for the 2019 version, was optimizing the set of criteria. For example, in the area of trade control legislation, a decision, based on expert advice, was made to identify a finite list of indicators that would show countries having in place "sufficient" strategic trade control legislation. These indicators included having in place national legislation, national authorities relating to trade controls, export control lists, catch-all clauses, and signs of implementation of legislation, to name a few.

After the selection of the basic list of sub-criteria, and the initiation of the data collection phase of the project, we found that adequate data were lacking for many sub-criteria, at least at the level needed to be able to use them in the PPI's comprehensive scoring system. In some cases, data were not available for enough countries to warrant using certain sub-criteria. Moreover, as data were sought and found for sub-criteria, some of the definitions needed to be revised or broadened. For the 2017 PPI, the project settled on a total of 97 indicators: 88 positive, point-earning sub-criteria, five negative, point-deducting sub-criteria, two extra credit opportunities, and two rounds of expert judgment where a country could gain or, in some instances, lose points. The sub-criteria were categorized into five major areas, or overarching "super criteria."

For the 2019 version, all sub-criteria and corresponding country data were revisited and re-vetted. While the five super criteria remained the same, several new sub-criteria were added, while others were dropped. The final 2019 sub-criteria comprise a total of 101 indicators: 89 positive sub-criteria, six negative sub-criteria, four extra credit opportunities, and two rounds of expert judgment.

The **five major super criteria** categories remained the same. They are, and include information about, a country's:

1. **International Commitment** to preventing strategic commodity trafficking;
2. **Legislation** in place that regulates and oversees trade in strategic commodities, and criminalizes and aims to prevent strategic commodity trafficking;
3. **Ability to Monitor and Detect Strategic Trade;**
4. **Ability to Prevent Proliferation Financing;** and
5. **Adequacy of Enforcement** against strategic commodity trafficking.

The sub-criteria under each super criterion category are listed and explained in subsequent chapters in Section I. Each sub-criterion is appropriately weighted by the project to derive a ranking for each country under the super criteria. We do not include a ranking of countries under each super criterion. The *Legislation* super criterion remains for this update the only super criterion that includes a breakdown into five groups of countries by the comprehensiveness of their trade control legislation, focusing on control of exports.

Countries are assigned a total final score and a resulting ranking by combining all individual super criteria scores. The full ranking and scores included in Annex I compare all 200 countries, entities, and territories. To obtain the full ranking, the super criteria are themselves weighted differently as to their significance. The *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria are weighted the most; *Legislation* and *Ability to Monitor and Detect Strategic Trade* are given half the impact of those; and *International Commitment* is given a quarter of the impact of *Ability to Prevent Proliferation Financing* and *Enforcement*. In total, countries could receive a maximum of 1,300 points.

An original goal in the PPI's project methodology development process was to qualitatively assign each country to one of four areas of adequacy. However, as the project developed, another approach was created, one of evaluating groupings of similar countries and performance metrics that aim to guide the improvement of trade control systems of countries that are alike in many ways. Nonetheless, because of the usefulness of this broad approach, we have included a cluster analysis in this edition that categorizes the countries into four groups via their total scores.

Instead of only assessing countries by a full ranking and comparing them against one another—for example, regardless of whether they are

small island nations without much participation in international trade or major world economies, or comparing non-nuclear weapon states without access to domestic nuclear technology to nuclear weapon states that have a higher capacity to transfer this technology—the project also decided to separate countries into three tiers, discussed in the Introduction and detailed in Section II. This manner of evaluating countries acknowledges that smaller countries and countries that trade less, and those that have fewer resources to devote to trade controls, are not realistically expected to match the trade control performance of major world economies. The tiering system shows better how comparable countries rank next to their peers in their potential to prevent the trafficking of strategic commodities. This approach is also consistent with UNSCR 2325 (2016).

A key source of data for the sub-criteria was the UN Security Council Resolution 1540 matrices. However, the PPI project sought to confirm, and as necessary, supplement, these data. For example, the attributes of legislation declared in the 1540 matrices were confirmed individually by looking at primary source documents, unless otherwise specified in the sub-criterion definition. If there was no entry in the matrix or it was not possible to confirm the source, government websites and other legislation databases were consulted until the PPI could identify and evaluate each country's strategic trade control legislation or approach. In the end, trade control legislation (or lack thereof) for almost all of the 200 countries and territories was identified and evaluated. Because many laws were not in English, PPI project staff and consultants performed a great deal of translation from a variety of languages, including Chinese, French, Arabic, Spanish, German, and Hindi, among others.

The project depended on open source data, in particular information available online. This approach has limitations. Many of the sub-criteria that were not used would have depended on data held by governments that are not typically published. Some data are classified. A few examples of proposed, but rejected, sub-criteria where the project encountered problems in finding information were: a government's knowledge of supply chains in its country; the existence of technical reachback capabilities, such as drawing on information and expertise from more knowledgeable countries; the transfer of internal investigations into trade control enforcement efforts; and internal capabilities, such as those of domestic intelligence agencies, to detect illicit trade networks.

Sending project staff to visit all 200 countries or even a significant number of them was judged as too costly. The project also decided not to send out survey questionnaires to all the countries. Part of the reason was that the 1540 matrices and Financial Action Task Force evaluation reports, which were used for proliferation financing data, already contain a considerable amount of national self-reporting that is directly relevant to the PPI sub-criteria. In addition, project staff did not believe that enough countries would have an incentive to respond any differently or more completely than they do to the 1540 Committee and FATF, particularly concerning more sensitive trade control enforcement information. Moreover, the project lacked the resources to verify survey information.

To compensate for some of these limitations, the project utilized the Institute's extensive in-house resources and expertise of staff on strategic commodity controls and trafficking. In particular, the project benefited from hundreds of Institute case studies on commodity trafficking that shed light on specific countries' capabilities to control trade and to detect, prevent, or prosecute those making illicit exports.

Project staff also conducted a number of interviews with experts from a range of countries. Those interviews focused on gaining information from people with specific, direct knowledge of countries' trade control systems and their implementation. Many had provided capacity building or expert consultation in a number of countries or worked on programs that extended capacity building assistance. Information on over 60 countries was collected from these experts. The interviews helped add to the evaluation of the effectiveness and enforcement efforts of countries' trade control systems.

No index is without limitations, and the 2019 update contains them. Given that the PPI is the first attempt at comprehensively evaluating the effectiveness of national strategic trade controls, at least publicly or as far as we could determine, we are fully cognizant of the limitations of the index.

CHAPTER 2

SUPER CRITERION INTERNATIONAL COMMITMENT

Super Criterion International Commitment focuses on a state's international commitment to non-proliferation of nuclear weapons, weapons of mass destruction (WMD), missiles, and other weapons capabilities, as well as preventing the spread of sensitive or controlled materials and equipment. It measures memberships and adherence to a range of non-proliferation conventions, treaties, regimes, and groups. Commitment is not a measure of effectiveness or implementation of the principles or provisions of these instruments on a national level, but it is an important first step. It shows a willingness of a state to follow international standards, potentially improve their own performance, dedicate resources to doing so, share information with other countries and regimes, and allow susceptibility to international pressure.

A state's international commitment to non-proliferation related treaties and conventions is seen in the quality and quantity of the regimes it is party to. Super Criterion *International Commitment* includes an evaluation of a country's adherence to 22 sub-criteria, in this case key international regimes or agreements, as indicators of performance. Each of the sub-criteria is weighted as low, medium, or high impact by PPI staff to determine a sufficiency rank under the super criterion. Of the 22 sub-criteria, three are considered low-impact, ten are medium-impact, and nine are high-impact. They are worth 5, 10, and 15 points, respectively. A country could receive a raw total of 250 points. This raw score is used

later to arrive at a total, weighted score and rank. It is also used to derive a ranking under the three tiers of countries discussed in detail in Section II.

International Commitment does not assess performance, only membership and participation in international regimes or being a party to legal instruments, such as the Treaty on the Non-Proliferation of Nuclear Weapons or Nuclear Weapon Free Zones (NWFZs). Thus, it has a relatively low value compared to the other super criteria when the final score is calculated, and reflects the greater emphasis placed in the PPI on implementation and effectiveness of trade control systems.

Partial credit (usually half of the possible sub-criterion points) was given if a country has only signed but not yet ratified an agreement. It should be noted that, in general, an individual country might not be able to achieve 100 percent of the available points. For example, membership in export control arrangements such as the Nuclear Suppliers Group is by invitation, which might not be forthcoming for some. A country might also be in a location for which there is no relevant nuclear weapon-free zone, such as most of Europe and the Middle East. In addition, the PPI has been constructed for a number of entities whose status makes them ineligible to adhere formally to international legal instruments, for example, Hong Kong and Taiwan.

SUB-CRITERIA¹:

- Member of Nuclear Suppliers Group²**

While not legally binding, NSG members are expected to follow certain guidelines regarding the export of sensitive nuclear and nuclear-related facilities, commodities, and material. Specific membership requirements apply, including the adoption of a comprehensive export control list into national legislation. Members generally have the capability of supplying goods classified as nuclear or nuclear dual-use.³ Some countries, such as Israel, adhere to the NSG guidelines, but are not official members. For the 2019 PPI, we assign partial points in this case. NSG membership is a high-impact sub-criterion.

- Member of the International Maritime Organization (IMO)⁴**

Membership in the IMO has no direct legal implications; however, the IMO assists with the drafting and implementation of legally binding

conventions to promote lawful, secure, and safe trade via sea routes. Of these, most relevant for the PPI is the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, which, among other things, makes it a criminal offense to transport via sea nuclear material and equipment without adequate control or permission by a state party or other applicable governing body. It is a high-impact sub-criterion.

- **Party to the Convention for the Suppression of Acts of Nuclear Terrorism⁵**

This legally binding convention requires countries to actively counter and prevent the possibility of nuclear terrorism. State parties are required to make criminal offenses a wide range of activities related to nuclear and other radioactive material and nuclear facilities, which results in stronger deterrence of illicit conduct by individuals. It is a high-impact sub-criterion.

- **Member of the Missile Technology Control Regime (MTCR)⁶**

Although not legally binding, members of the MTCR commit to adhere to stringent export control measures for a specific set of missile-related technologies. Joining the MTCR shows awareness and openness to being governed by regulations relating to preventing the spread of ballistic and cruise missiles and their technologies. Membership eligibility also depends on a country's Nuclear Non-Proliferation Treaty, Chemical Weapons Convention (CWC), and Biological Weapons Convention (BWC) statuses. Some countries, such as Kazakhstan, adhere to the regime but are not official members. In that case, for the 2019 PPI, partial points were awarded. It is a high-impact sub-criterion.

- **Participant in the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods⁷**

The Wassenaar Arrangement is a voluntary, non-legally binding multi-lateral agreement where states agree to adhere to recommendations and guidelines on their exports of nuclear-related goods and conventional arms. Specifically, parties agree not to export categories of dual-use goods and technologies and munitions contained on control lists to parties that would not enhance the goal of international security. They also agree to use the guidelines in the drafting of their national export control legislation. Membership eligibility also depends on a country's

Nuclear Non-Proliferation Treaty (NPT), Chemical Weapons Convention (CWC), and Biological Weapons Convention (BWC) statuses. Some countries adhere to the arrangement but are not official members. In that case, under the 2019 PPI, partial points were awarded. It is a high-impact sub-criterion.

- **Participant in the Proliferation Security Initiative (PSI)⁸**

Not legally binding, the PSI is a voluntary initiative to network with other states to prevent WMD-related illicit trade by land, sea, or air. States commit to “impede and stop shipments of WMD, delivery systems, and related materials” based on a set of “Interdiction Principles.” This is arguably one of the most directly relevant international agreements for the PPI. As such, it is a high-impact sub-criterion.

- **Member of the World Customs Organization (WCO)⁹**

Being a member of the WCO has no direct legal implications, however, the WCO introduces recommendations, declarations, and initiatives, and sponsors legally-binding conventions administered by its Customs Cooperation Council. State willingness to maintain high customs safeguards and standards plays a crucial role in the prevention of commodity trafficking. WCO membership is a high-impact sub-criterion.

- **Member of the Financial Action Task Force (FATF) and FATF Regional Body member¹⁰**

While measuring a state’s commitment to preventing the financing of proliferation is its own super criterion under the PPI, membership to the FATF and its regional bodies shows commitment that ideally filters down into a state’s development of legislation regarding this matter. Before a country can become a FATF member, its financial practices and controls must undergo a rigorous review process. It is a high-impact sub-criterion.

- **Has an International Atomic Energy Agency (IAEA) Additional Protocol (AP) to its Comprehensive Safeguards Agreement (CSA) in force¹¹**

Although states are not required to conclude Additional Protocols, the AP is a binding agreement once ratified. It provides the IAEA with enhanced verification tools designed to detect undeclared nuclear material and activities. According to the IAEA, it is granted legal “expanded rights

of access to information and locations in the States. For States with a CSA, the Additional Protocol aims to fill the gaps in the information reported under a CSA.” Under the 2019 PPI, the AP sub-criterion was changed to high-impact. Only countries where the AP is in force received full points; signature allowed for partial points. Countries that signed the AP more than ten years ago and still have not entered it into force received no points.

- **Party to the Treaty on the Non-Proliferation of Nuclear Weapons¹²**

The NPT is a foundational step for a country in committing never to manufacture, otherwise acquire, or transfer nuclear weapons. Seven PPI countries or entities did not receive points, three of which are not official states, and are therefore not eligible to sign the treaty. The four states that did not receive points are Israel, India, Pakistan, and South Sudan. The Democratic People’s Republic of Korea (DPRK) received points for signing the NPT, even though it withdrew in 2003, only because the IAEA does not recognize its withdrawal reason and still considers the DPRK party to the NPT.

The 2019 PPI grants two states, the Cook Islands and Niue, partial points for considering themselves bound to the NPT, even though they have not signed it. It is a medium-impact sub-criterion.

- **Has an IAEA CSA in force¹³**

A comprehensive safeguards agreement allows the IAEA to safeguard all nuclear facilities and material in peaceful uses within a country to ensure their exclusively non-military use. The CSA allows the IAEA to implement safeguards on all such nuclear material to ensure they are not diverted to the manufacture of nuclear weapons or nuclear explosive devices for purposes unknown. All non-nuclear weapons states that are parties to the NPT are required to conclude a CSA, however, under the 2019 PPI, the point assignment was updated such that countries which have an IAEA Small Quantities Protocol (SQP) in force (the following sub-criterion) do not also receive points for having a CSA. Countries that have the CSA and no SQP received full points. Countries with a CSA and SQP received points only in the SQP sub-criterion. This is because a SQP suspends the application of many provisions of the comprehensive

safeguards agreement. Countries with an older version of the SQP received half points. This is a medium-impact sub-criterion.

- **Has in place a SQP to CSA¹⁴**

The SQP can be concluded along with a CSA. According to the IAEA, starting in 1974, a standardized small quantities protocol was made available to states with minimal or no nuclear material and no nuclear material in a “facility.” In 2005, the IAEA Board of Governors decided that any future small quantities protocols should use a revised small quantities protocol that reduces the number of provisions of the comprehensive safeguards agreement that are held in abeyance, and makes operative key provisions related to reporting nuclear material and the conduct of inspections. Often, the SQP is in effect for states that use limited quantities of nuclear material at research or academic facilities or at medical venues. It is a medium-impact sub-criterion.

- **IAEA reached a positive Safeguards Conclusion for the country in 2017¹⁵**

A safeguards conclusion is a public IAEA evaluation made each year for all safeguarded states. If a country has a CSA but no AP in place, the IAEA can reach a “conclusion” that *all declared nuclear material* remained in peaceful uses. The IAEA can also try to reach the more time consuming “broader conclusion” for those countries that have ratified the AP, meaning the IAEA confirms that, in general, there is no evidence of diversion of nuclear material and all nuclear material remains in peaceful uses in the state as a whole. No conclusions can be reached for countries that have not signed a CSA, or have signed but not ratified it. The 2019 PPI used safeguards conclusion data for 2017. It is a medium-impact sub-criterion.

- **Party to a Nuclear Weapon Free Zone (NWFZ) Treaty¹⁶**

A NWFZ Treaty is a regional, legally binding agreement where individual countries commit to keeping the whole region nuclear weapons-free. While countries in certain zones (North America, the Middle East, and Europe) have not yet established NWFZs, there are five successful, established NWFZs: Treaty of Tlatelolco for Latin America and the Caribbean, Treaty of Rarotonga for the South Pacific, Treaty of Bangkok for Southeast Asia, Treaty of Pelindaba for Africa, and the Central Asian NWFZ. These zones include countries that once pursued or inherited, but then

renounced, nuclear weapons programs and indicate a strong commitment to non-proliferation. It is a medium-impact sub-criterion.

- **Party to the Convention on the Physical Protection of Nuclear Material (CPPNM)¹⁷**

Through this legally binding IAEA convention, states commit to adhere to international standards governing the protection of nuclear facilities and materials during use, storage, and transport. The 2019 PPI awarded full points only if a country also ratified the 2015 CPPNM amendment. Ratifying the original CPPNM resulted in half points. Signature to the original CPPNM only resulted in no points. It is a medium-impact sub-criterion.

- **Party to the Chemical Weapons Convention¹⁸**

Legally binding adherence to the treaty commits countries to not pursue chemical weapons and to collaborate internationally to eliminate them altogether. Adherence to the CWC results in greater information sharing, as well as access to training and equipment in many areas that are applicable to countering broader strategic commodity trafficking, such as improved export and border control measures. For 2019, the sub-criterion's impact was changed from low to medium.

- **Party to the Biological Weapons Convention¹⁹**

Legally binding adherence to the treaty commits countries to not pursue chemical weapons and to collaborate internationally to eliminate them altogether. Adherence to the BWC results in greater information sharing, as well as access to training and equipment in many areas that are applicable to countering broader strategic commodity trafficking, such as improved export and border-control measures. For 2019, the sub-criterion's impact was changed from low to medium.

- **New: Party to the Convention on Combating Bribery of Foreign Public Officials in International Business Transactions²⁰**

This convention is administered by the Organisation for Economic Co-operation and Development (OECD) and “establishes legally binding standards to criminalize bribery of foreign public officials in international business transactions.” It also established a Working Group to monitor implementation and publishes country implementation reports and recommendations. The PPI assessed that signature to the convention

would likely ensure more regulated trade of strategic commodities and equipment by reducing corruption and bribery of officials involved in regulating export processes. Information on the convention is available on the OECD's website. It is a medium-impact sub-criterion.

- **New: Member of the Australia Group (AG)²¹**

The AG is one of the four major global export control and non-proliferation groups. While participation is not legally binding, the group supports strict and streamlined export controls of chemical and biological weapons and their precursors, as well as related equipment and technologies. Not all countries are eligible for membership; prior to joining the AG, a country must fulfil certain criteria demonstrating a firm commitment to non-proliferation of chemical and biological weapons. The group also offers a platform for information sharing, and assists countries with their implementation of the BWC and CWC. In line with making the CWC and BWC a medium-impact indicator in the 2019 version, AG membership is also of medium-impact. Adherents received half of the available points.

- **Member of the International Atomic Energy Agency²²**

The IAEA was granted a mandate in 1957 to work with United Nations member states and other partners to “promote safe, secure and peaceful nuclear technologies”²³ and to “establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information...are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State’s activities in the field of atomic energy.”²⁴ As of April 2018, 170 states were members of the IAEA, meaning its Board of Governors had recommended them and they had deposited an instrument of ratification of the IAEA Statute and its terms. However, rather than for non-proliferation reasons, states mainly join the IAEA to benefit from its promotion of the peaceful use of nuclear energy. Therefore, for 2019, this sub-criterion was changed from medium to low-impact.

- **Reports to the IAEA Incident and Trafficking Database (ITDB)²⁵**

Countries that report incidents involving trafficking of nuclear-related materials or related incidents within their territories increase international collaboration and help the IAEA and all other countries identify

strengths and weaknesses regarding abilities to monitor and secure nuclear equipment and material. It is a low-impact sub-criterion.

- **Party to the Hague Code of Conduct against Ballistic Missile Proliferation (HCOC)²⁶**

Not legally binding, this voluntary effort strengthens state efforts against ballistic missile proliferation, specifically the proliferation of missiles capable of delivering WMD. The guidelines set out in the Code of Conduct promote transparency and information sharing, for example, subscribing members voluntarily commit to “provide pre-launch notifications (PLNs) on ballistic missile and space-launch vehicle launches (SLVs) and test flights.” They also commit to submit annual declarations of their national policies on ballistic missiles and SLVs. It is a low-impact sub-criterion.

IMPACT OF SUB-CRITERIA:

As discussed above, the PPI assigns a low to high impact for weighting each of the sub-criteria. **Table 2.1** compiles how each indicator is weighted in the evaluation and how much of an impact it therefore has on a country’s score and rank within the super criterion.

SCORING:

Of the 22 sub-criteria, three are considered low-impact, ten are medium-impact, and nine are high-impact. They are worth 5, 10, and 15 points, respectively. A country could receive a raw total of 250 points. This raw score is used later to arrive at a total, weighted score and rank. It is also used to derive a ranking under the three tiers.

HIGH-IMPACT (9)
NSG, IMO, Convention for the Suppression of Acts of Nuclear Terrorism, MTCR, Wassenaar Arrangement, PSI, WCO, FATF, AP
MEDIUM-IMPACT (10)
NPT, IAEA CSA, SQP, IAEA Safeguards Conclusion for 2017, NWFZ, CPPNM, CWC, BWC, OECD Convention on Bribery, AG
LOW-IMPACT (3)
IAEA member, Reporting to IAEA ITDB , HCOC

Table 2.1. The impact of each *International Commitment* sub-criterion.

NOTES

1. For the 2019 PPI, we discontinued the use of two sub-criteria: “Participation in voluntary reporting scheme for the import and export of a list of items on the 2015 AP control list, INFCIRC/540 Annex II,” because the source for the sub-criterion is not public; and “Has in place a Customs Mutual Assistance Agreement (CMAA) with the United States,” due to this data already being included in Super Criterion *Adequacy of Enforcement*. Two new sub-criteria were added for the 2019 PPI: “Member of the Australia Group,” and “Party to the Organisation for Economic Co-operation and Development (OECD) Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.”

2. Nuclear Suppliers Group, <http://www.nuclearsuppliersgroup.org/en/>

3 According to the NSG, factors taken into account for participation include the following:

- The ability to supply items (including items in transit) covered by the Annexes to Parts 1 and 2 of the NSG Guidelines;
- Adherence to the Guidelines and action in accordance with them;
- Enforcement of a legally based domestic export control system which gives effect to the commitment to act in accordance with the Guidelines;
- Adherence to one or more of the NPT, the Treaties of Pelindaba, Rarotonga, Tlatelolco, Bangkok, Semipalatinsk or an equivalent international nuclear non-proliferation agreement, and full compliance with the obligations of such agreement(s);
- Support of international efforts towards non-proliferation of weapons of mass destruction and of their delivery vehicles.

4. International Maritime Organization, <http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/SUA-Treaties.aspx>

5. *International Convention for the Suppression of Acts of Nuclear Terrorism*, <http://legal.un.org/avl/ha/icsant/icsant.html>. Under the 2019 update, Benin, Palestine, and Singapore newly received points for ratifying or acceding to the Convention.

6. Missile Technology Control Regime, <http://mtcr.info/>

7. Wassenaar Arrangement, <http://www.wassenaar.org/>. Under the 2019 update, India received points for joining the Wassenaar Arrangement in December 2017.

8. Proliferation Security Initiative, <http://www.psi-online.info/>

9. World Customs Organization, <http://www.wcoomd.org/>

10. Financial Action Task Force, <http://www.fatf-gafi.org/>. Under the 2019 update, Djibouti and Madagascar newly received points for joining MENAFATF and ESAAMLG, respectively. Israel received additional points for joining FATF in December 2018.

11. International Atomic Energy Agency Additional Protocol, <https://www.iaea.org/topics/additional-protocol>. Under the 2019 update, Honduras, Thailand, and Senegal newly received points for entering the AP into force. Points were removed for Belarus, Benin, Cape Verde, Kiribati, Malaysia, and Tunisia. Iran received points for signing. Taiwan received points for acting as if it has ratified the Additional Protocol, despite not formally having a CSA.
12. *Treaty on the Non-Proliferation of Nuclear Weapons*, Adopted June 12, 1968, <https://www.iaea.org/publications/documents/treaties/npt>
13. International Atomic Energy Agency Comprehensive Safeguards Agreement, <https://www.iaea.org/safeguards/safeguards-legal-framework/safeguards-agreements>. Under the 2019 update, points for Macedonia were corrected. Taiwan received points for adopting the Additional Protocol despite not formally having a CSA.
14. IAEA, “More on Safeguards Agreements–Small Quantities Protocol,” <https://www.iaea.org/topics/safeguards-legal-framework/more-on-safeguards-agreements>
15. International Atomic Energy Agency Safeguards Conclusion for 2017, <https://www.iaea.org/sites/default/files/18/06/statement-sir-2017.pdf>. Taiwan’s points were corrected for reaching the broader conclusion. Liechtenstein, Montenegro, and Tajikistan newly received points under the 2019 PPI for the IAEA reaching the broader conclusion
16. Nuclear Weapon Free Zones, <https://www.un.org/disarmament/wmd/nuclear/nwfz/>
17. International Atomic Energy Agency, *Convention on the Physical Protection of Nuclear Material*, <https://www.iaea.org/newscenter/news/update-eight-questions-and-answers-on-the-amendment-to-the-convention-on-the-physical-protection-of-nuclear-material>. The CPPNM entered into force in 1987. It addressed international transport of nuclear material. It was amended in 2005 to extend its reach to nuclear material in domestic use and to nuclear facilities. The amendment entered into force in 2016. The amendment calls for the amended treaty to be named the Convention on Nuclear Material and Facilities. However, the IAEA Secretariat, in line with established depositary practice, will continue to refer to the “CPPNM” and to the “Amendment to the CPPNM” until all States Parties to the CPPNM have consented to be bound by the amendment in order to not give the impression that, alongside the original convention, there is now a new convention and that states could join one or the other. <https://www.iaea.org/newscenter/news/update-eight-questions-and-answers-on-the-amendment-to-the-convention-on-the-physical-protection-of-nuclear-material>. For the 2019 PPI, points were corrected to take into account the withdrawals of the following countries: Bulgaria, Hungary, Mongolia, Netherlands, Poland, Romania, Russia, and South Africa.
18. *United Nations Chemical Weapons Convention*, <https://www.opcw.org/chemical-weapons-convention/>
19. *United Nations Biological Weapons Convention*, <https://www.un.org/disarmament/wmd/bio/>

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20. *OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions*, <http://www.oecd.org/corruption/oecdantibriberyconvention.htm>
21. Australian Department of Foreign Affairs and Trade, *The Australia Group*, <https://australiagroup.net/en/index.html>
22. IAEA List of Member States, <https://www.iaea.org/about/governance/list-of-member-states>
23. IAEA History, <https://www.iaea.org/about/overview/history>
24. IAEA Statute, as amended up to December 28, 1989, <https://www.iaea.org/sites/default/files/statute.pdf>
25. International Atomic Energy Agency Incident and Trafficking Database, <http://www-ns.iaea.org/security/itdb.asp>
26. *United Nations Hague Code of Conduct*, <http://www.hcoc.at/>. Under the 2019 update, Lesotho received points for subscribing to the HCOC in January 2018.

CHAPTER 3

SUPER CRITERION LEGISLATION

Super Criterion Legislation focuses on a state's legislation, regulations, and related national authorities that are tools or capabilities to control strategic trade in sensitive commodities, with a focus on nuclear and nuclear-related goods. It assesses 13 sub-criteria, or indicators of performance, one of which is an extra credit opportunity. The ability of a country to act to prevent strategic commodity trafficking lies at the heart of the PPI. Without the legal basis and tools to act against illicit procurement, such efforts cannot be detected, investigated, and shut down, and key actors cannot be prosecuted. Legislation does not need to be the same for each country, but legislation that is adequate to achieve its mission should include, to name a few, provisions addressing import and export controls including licensing of controlled goods, the transfer and transport of sensitive commodities, and those necessitating financing regulations to prevent illicit purchases. It should also provide for the national use of proper documentation to control imports and exports and information sharing systems that help with regulation.

The *Legislation* super criterion assesses whether a country has legislation, authorities, and regulations in place to control strategic or sensitive trade. Experts were consulted in the development of the list of legislative sub-criteria. The goal was to develop a list of key indicators of strategic trade control laws, which could show the extent of control legislation and differentiate between countries' controls.

All countries, and not only major economies involved in international trade or NSG member countries, have an opportunity to score highly under this super criterion if they strongly police imports and exports in general, rather than only strategic commodities. Of the 13 sub-criteria, four are considered low-impact, four are medium-impact, and four are high-impact, worth 5, 10, and 15 points respectively, and one is an extra credit opportunity. Excluding the extra credit opportunity, a country could receive a raw total of 120 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers. In addition, the project scores the comprehensiveness of all 200 countries', territories', and entities' export control legislation (not including import, transit, and transshipment) and divides them into five sub-categories.

Significant effort was put into finding all relevant legislation or confirming its existence by a reliable third party (such as the IAEA or European Parliament). Effort was made to ensure that non-English legislation and scanned documents, which are non-searchable, were detected and included. In addition to government websites, helpful resources were: the UN Office for Disarmament Affairs database, Resolution 1540 matrices, International Labour Organization database, Arms Trade Treaty Baseline Assessment Project, and GunPolicy.org.¹

SUB-CRITERIA²:

- **National export control legislation includes a catch-all clause³**

A catch-all clause is a component of legislation that is designed to “catch” the export of goods that may not be listed on export control lists but that may be used in sensitive weapons, or sanctioned or unsafeguarded, programs. As such, they require authorization for export. The 1540 matrix provides information on which countries include a catch-all clause as a part of their national export control legislation. For countries that did not report a catch-all clause to the 1540 Committee, an effort was made to individually verify whether similar legislation exists in the country. At least two countries are actively working on implementing a catch-all clause at the time of data collecting and are expected to receive points for

the sub-criterion in a future PPI version: Thailand and the United Arab Emirates (UAE). This is a high-impact sub-criterion.

- **Comprehensiveness of export control legislation such as encapsulating NSG Parts 1 and 2 lists⁴**

The most rigorous national export control legislation encapsulates a comprehensive list of controlled items that include the NSG Parts 1 and 2 lists, and goes even further by adding additional items. An attempt was made to find a list of export-controlled items for each country. However, in some cases, national legislation refers to a set of controlled items without a country making a detailed list easily and publicly available. In that case, the PPI looked at the comprehensiveness of the law referring to the list. This is a high-impact sub-criterion.

- **Transit control legislation is in place⁵**

This indicator sought to collect trade regulations for each country addressing the treatment of nuclear weapons-related materials⁶ in transit. Many countries have reported the existence of such regulations to the 1540 Committee. For the PPI, the data are taken from the 1540 matrices, and not individually collected. For existing legislation not reported to the 1540 Committee, no points were assigned. By this decision, the PPI supports the 1540 Committee's request for information and encourages countries to report fully and accurately. This is a high-impact sub-criterion.

- **Transshipment control legislation is in place⁷**

This indicator sought to collect trade regulations for each country addressing the treatment of nuclear weapons-related materials⁸ that are being transshipped through the country. Many countries have reported the existence of such regulations to the 1540 Committee. The PPI used data in the 1540 matrices, and not data individually collected. For existing legislation not reported to the 1540 Committee, no points were assigned. By this decision, the PPI supports the 1540 Committee's request for information and encourages countries to report fully and accurately. This is a high-impact sub-criterion.

- **Presence of licensing process for export licenses**

The presence of a licensing process for export licenses refers to whether a country has a formal process to adjudicate decisions on making or rejecting applications for export permits or licenses for companies to export any type of controlled good. Information for this sub-criterion was collected through individual internet searches on a country-by-country basis. This is a medium-impact sub-criterion.

- **An authority regarding civil and criminal investigations is designated by law⁹**

This indicator refers to the existence of a government body that deals with violations of trade control laws and regulations, and whether it has civil and criminal investigation authorities. Members of Interpol list their respective authorities in a publicly available database. For most countries the investigative authority is the federal police. This is a medium-impact sub-criterion.

- **Import control legislation includes a list of controlled goods**

This indicator refers to legislation in place that lists all controlled and banned imports, especially with regard to nuclear direct-use goods, radioactive materials, or goods that are capable of being used in weapons of mass destruction (WMD). These data include an itemized list of controlled imports for countries. Sufficient import controls are especially relevant for countries in Tiers Two and Three, which pose a transit or diversion concern rather than a supplier concern for strategic commodity trafficking. This is a medium-impact sub-criterion.

- **End-use statements are required for export licenses¹⁰**

An end-use statement is a legal declaration made by an importing party and discloses the final destination and intended use of a good. This is especially important to have in place for countries that can supply nuclear direct- and dual-use goods or those countries in Tier One. End-use statements can be used to later check whether the good is being used by the intended party and for the authorized use. This is a medium-impact sub-criterion.

- Import license or declaration is required to import goods¹¹

This indicator refers to whether or not an import license or declaration is required to import goods. This is especially important for countries that are heavily involved in the re-export of goods, or Tier Two countries, because it allows authorities the chance to detect illicit goods crossing their territories. The PPI assigned the same points for those countries that require an import permit or license, and those that only require an import declaration at customs. As the requirement is not specifically for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low-impact. Of note, rigorous import controls seemed more common than rigorous export controls.

- Certificates of Origin are required for imports or re-exports¹²

The International Chamber of Commerce defines a Certificate of Origin as “an important international trade document that certifies that goods in a particular export shipment are wholly obtained, produced, manufactured or processed in a particular country.”¹³ The World Bank’s “Ease of Doing Business” database provides information for almost all countries on whether a Certificate of Origin is required for the import or re-export of certain goods. As the requirement is not specified for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low-impact.

- Bills of Lading (BOL) are required for carriers during transport¹⁴

A BOL assigns legal responsibility for goods during transport. According to a definition published by *The Economic Times*, a BOL “...acts as a receipt and a contract. A completed BOL legally shows that the carrier has received the freight as described and is obligated to deliver that freight in good condition to the consignee.”¹⁵ It is relevant for preventing strategic commodity trafficking as it adds accountability and monitoring of goods during transport. The World Bank’s “Ease of Doing Business” database provides information for almost all countries on whether a Bill of Lading is required for the shipment of goods. As the requirement is not specifically for nuclear direct- or dual-use goods, but all goods in general, this indicator was weighed as having low-impact.

- **Intellectual Property Rights are protected¹⁶**

The protection of sensitive information is highly valuable in sectors that both use and export strategic commodities. Ideally, the PPI authors would want to compare how countries protect from unintended use, in particular, weapons-related knowledge and expertise, including, for example, electronic information, designs, or calculations. This was not possible to determine for each country. In addition, there is no international agreement, even among the United States and its allies, as to what constitutes classified or sensitive weapons information. In the nuclear area, the NSG is also struggling with establishing controls on the export of information, e.g. intangible technology transfers. As a result, the PPI settled on a far lesser criterion, namely the assessment of the regulation and protection of know-how in general using the 2016 Intellectual Property Rights scores calculated by the Property Rights Alliance. Since these scores are used for their potential implications only, this indicator was determined to be low-impact.

NEW: EXTRA CREDIT INDICATOR:

- **Party to nuclear cooperation agreement containing provision to forgo reprocessing and enrichment¹⁷**

Countries that have a “gold standard” condition in a 123 nuclear cooperation agreement (named after section 123 in the Atomic Energy Act) with the United States or another supplier country are awarded extra credit points. This so-called “gold standard” nuclear cooperation provision requires a country to agree to strict non-proliferation requirements that it forego seeking or developing enrichment and reprocessing capabilities. The country has an added incentive to apply additional scrutiny to the movement of strategic goods both coming into and leaving the country, which is often expressed in the form of strong strategic trade control laws. The United Arab Emirates and Taiwan are the only two PPI entities to date with such an agreement, but because this is an extremely important concept, this sub-criterion is used as extra credit.

CONSIDERED SUB-CRITERIA

Project staff considered additional sub-criteria but were unable to find enough information for a sufficient number of countries, thus they were not included in scoring:

1. The form or format for end-use statements is comprehensive, requires detailed descriptions of the end user and the end use, and contains a non-re-export clause. The UN Office for Disarmament Affairs (UNODA) Occasional Paper, Study on the Development of a Framework for Improving End-Use Control Systems, No. 21, December 2011, provides valuable insights in the topic of end-user controls, however, the PPI decided this source is too dated to be used for scoring in the PPI.
2. Physical end-use verification for dual-use goods. This type of verification is made by a government or company at the site of the good's stated end destination and can have significant impact on detecting the unintended diversion of exported goods. It seeks to determine that the stated buyer is an actual physical entity and that it is using the good for the stated end-use. While many exporters require an end-use statement prior to finalizing a sale and making an export, few countries (or their companies) use end-use verification as a monitoring tool against the illicit diversion of sensitive goods. Germany and the United States stand out as two of few countries that use this tool. Tier 1 countries should especially use end-use verification to check the location and use of nuclear-related goods. Few other countries have the financial and technical resources that would be needed to carry out such checks. A risk-based approach should be used to determine priority goods and destinations for post-shipment end-use verification.
3. A specific nuclear-related licensing agency exists within the country. This authority refers to a government body in charge of granting export licenses for the export of nuclear-related goods. An attempt was made to assign points for countries that have a specific nuclear-related export body or office, but the majority of countries use a general export control or customs agency, so this sub-criterion was dropped.
4. Implementation of additional, unilateral sanctions. The PPI attempted to assign points for countries that employ and implement additional sanctions against known proliferant states or illicit networks that supplement UN sanctions. Not enough countries deployed additional unilateral sanctions to make this sub-criterion usable.
5. A license or authorization is required for holding technical and potentially sensitive talks and presentations abroad. This is one way of controlling intangible technology transfer.

IMPACT OF SUB-CRITERIA:

The PPI assigned a low to high impact for weighting each of the sub-criteria. **Table 3.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country's score within the super criterion.

HIGH-IMPACT (4)	MEDIUM-IMPACT (4)	LOW-IMPACT (4)
Catch-all clause in legislation	Licensing process for export licenses	Import license or declaration required
Comprehensive export control legislation	End-use statements required for exports	Certificates of Origin required
Transit control legislation	Civil and criminal investigations authority	Bills of Lading required
Transshipment control legislation	Import control legislation incl. list of controlled goods	Intellectual property rights protected
<i>Extra Credit: Nuclear cooperation agreement that forgoes enrichment/reprocessing</i>		

Table 3.1. High, Medium, and Low Impact of Legislation sub-criteria.

SCORING AND SUFFICIENCY RANK:

Of the 13 sub-criteria, four are considered low-impact, four are medium-impact, and four are high-impact, worth 5, 10, and 15 points respectively, and one is an extra credit opportunity. Excluding the extra credit opportunity, a country could receive a raw total of 120 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

Under the sub-criterion *Comprehensive export control legislation*, the PPI team evaluated the quality and comprehensiveness of the export control legislation of the 200 countries, territories, and entities. The results were used to assign points towards a country's final PPI score, but also to place countries in one of the following five sub-categories. Existence of comprehensive legislation is not to be confused with its effective implementation, which will be discussed in subsequent super criteria chapters.

- **Green (legislation is comprehensive):** Legislation or agreements includes controls or clauses relating to export of nuclear direct-use and nuclear dual-use goods, (nuclear and nuclear-dual use commodity controls such as implementation of NSG Parts 1 & 2 or their equivalent), in addition to conventional weapons. The most commonly used lists are the European Union (EU) Control List and Wassenaar Arrangement list. This category counted 74 countries.
- **Light Green (legislation is somewhat comprehensive):** Legislation or agreements includes controls or clauses relating to export of nuclear direct-use goods (nuclear commodity controls such as implementation of NSG Part 1 list or an equivalent), in addition to conventional weapons. This category counted 10 countries.
- **Yellow (legislation is deficient):** Countries have comprehensive, overarching nuclear safety and security laws which place transfer controls on nuclear material and equipment. If the PPI was unable to locate relevant legislation, the 2018 Nuclear Threat Initiative (NTI) Nuclear Security Index was consulted, specifically its data on whether a country has or does not have a national legal framework for the Convention on the Physical Protection of Nuclear Material.¹⁸ These countries are not viewed as having effective trade control laws governing the export of nuclear and nuclear-related commodities, but their existing legislation is viewed as better in a relevant trade control sense than the legislation or lack of legislation in the Red and Orange categories. This category counted 22 countries.
- **Orange (legislation has serious deficiencies):** Legislation covers only exports of conventional weapons as laid out under the Arms Trade Treaty. This is not considered comprehensive trade control legislation for the PPI. This category counted 41 countries.
- **Red (legislation is non-existent or severely deficient):** Legislation includes exports of small arms and light weapons (SALW), and/or radioactive materials under environmental laws. This is not considered comprehensive trade control legislation for the PPI. This category counted 53 countries.

The project, in general, collected data on legislation from the spring of 2017 into the summer of 2018. An important development that occurred during this time was the introduction of the Caribbean Control List and the WMD Focus List. This initiative will, over time, lead to the implementation of a dual-use control list customized for the Caribbean countries. The PPI welcomes the progress and targeted approach that was taken by all of the participants. It should move the Caribbean countries to a green legislation color category in a future ranking.

Table 3.2. Export control legislation sufficiency rank by color category

Green (legislation is comprehensive)
Albania, Andorra, Argentina, Armenia, Australia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Holy See, Hong Kong, Hungary, Iceland, India, Iraq, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malaysia, Malta, Mexico, Moldova (Rep of the), Monaco, Montenegro, Namibia, Netherlands, New Zealand, Norway, Pakistan, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, San Marino, Serbia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United States of America
Light Green (legislation is somewhat comprehensive)
Brunei Darussalam, Cambodia, Kosovo, Lebanon, Libya, Myanmar, Tajikistan, Thailand, Uzbekistan, Viet Nam
Yellow (legislation is deficient)
Algeria, Bangladesh, Botswana, Cape Verde, Chile, Cuba, Ghana, Guatemala, Indonesia, Jamaica, Morocco, Nicaragua, Nigeria, Niue, Peru, Qatar, Rwanda, Sierra Leone, Sri Lanka, Tanzania (United Republic of), Uganda, Uruguay
Orange (legislation has serious deficiencies)
Barbados, Benin, Bhutan, Bolivia, Burkina Faso, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, El Salvador, Ethiopia, Fiji, Gabon, Gambia, Grenada, Kuwait, Lao People's Democratic Republic, Lesotho, Malawi, Mauritania, Mongolia, Nauru, Niger, Palau, Panama, Paraguay, Saint Kitts and Nevis, Samoa, Saudi Arabia, Senegal, Seychelles, Solomon Islands, Suriname, Syrian Arab Republic, Timor-Leste, Trinidad and Tobago, Turkmenistan, Tuvalu, Vanuatu, Venezuela (Bolivarian Republic of), Zambia
Red (legislation is non-existent or severely deficient)
Afghanistan, Angola, Antigua and Barbuda, Bahamas, Bahrain, Belize, Burundi, Cameroon, Central African Republic, Chad, Colombia, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Djibouti, Dominica, Democratic People's Republic of Korea, (DPRK), Egypt, Equatorial Guinea, Eritrea, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Iran (Islamic Republic of), Kenya, Kiribati, Liberia, Madagascar, Maldives, Mali, Marshall Islands, Mauritius, Micronesia (Federated States of), Mozambique, Nepal, Oman, Palestine (State of), Papua New Guinea, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Somalia, South Sudan, Sudan, Swaziland, Togo, Tonga, Tunisia, Yemen, Zimbabwe

NOTES

1. Unfortunately, some countries report environmental laws or similar as WMD-relevant export control laws to the 1540 Committee. See David Albright, Sarah Burkhard, Allison Lach, and Andrea Stricker, *The Peddling Peril Index for 2017* (Washington, D.C.: Institute for Science and International Security, 2018), Section III, Chapter 12 for the authors' recommendations, including those to the 1540 Committee.
2. The 2019 PPI discontinued the use of one sub-criterion, "Use of automated customs system," since it is also used under Super Criterion *Ability to Monitor and Detect Strategic Trade*. The authors added one new sub-criterion in the form of an Extra Credit Opportunity, "Party to nuclear cooperation agreement containing provision to forgo reprocessing and enrichment."
3. 1540 Committee Approved Matrices, Dated December 23, 2015, <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>; internet searches. In the 2019 PPI, Hong Kong, Philippines, and Taiwan newly received points.
4. Individual searches. Thailand, which was prematurely categorized as a dark green country in the 2017 PPI, recently postponed the implementation of its new dual-use items control list. The corresponding law, the Trade Controls on Weapons of Mass Destruction (TCWMD) Act is anticipated to enter into force in January 2020. Thailand is therefore moved from the dark green into the light green categorization for 2019. See: Rida Autchakit, "Thai export control update and introduction of new export control tool," *Deloitte Customs Alert*, January 11, 2019, <https://www2.deloitte.com/content/dam/Deloitte/th/Documents/tax/th-tax-customs-alert-thai-export-control-update-jan2019.pdf>
5. 1540 Committee Approved Matrices, Dated December 23, 2015 – January 27, 2017 <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. For example, 1540 Committee Matrix for Afghanistan, in row 20 of Table OP 3 (c) and (d), <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. A "X" in the "National Legal Framework" cell relating to NW (nuclear weapons) was taken as confirmation that sufficient legislation exists. A question mark was given partial credit. An empty cell received no points. Since the publication of the 2017 PPI, the 1540 Committee matrices of the following nine countries were updated: Brazil, Cuba, Czech Republic, Hungary, India, Jamaica, Poland, Turkey, and Ukraine.
6. The UN 1540 Committee defines "related materials" in the matrices as: "materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery."

CHAPTER 3

7. For example, see the 1540 Committee Matrix of Afghanistan, row 21, <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. In row 21 of a specific country's matrix, a "X" in the "National Legal Framework" cell relating to NW (nuclear weapons) was taken as confirmation that sufficient legislation exists. A question mark was given partial credit. An empty cell received no points.
8. The UN 1540 Committee defines "related materials" in the matrices as: "materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery."
9. The authorities for 190 countries were found in the respective country profiles published by the International Criminal Police Organization. Access to the country profiles is available here: Interpol, "World—A global presence," Member Countries, <https://www.interpol.int/Member-countries/World>. For the 2019 PPI, Palestine and Solomon Islands newly received points
10. For the 2019 update, the UAE newly received points.
11. For the 2019 PPI, points for Madagascar, Maldives, Morocco, New Zealand, Saudi Arabia, Seychelles, and the UAE were updated. Which import documents are required by a country can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents." http://www.doingbusiness.org/en/data/exploreeconomies/afghanistan#DB_tab
12. Whether a Certificate of Origin is required can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents." http://www.doingbusiness.org/en/data/exploreeconomies/afghanistan#DB_tab. In the 2019 update, points were changed for: Afghanistan, Georgia, Indonesia, Comoros, Malawi, Chad, and Iceland.
13. International Chamber of Commerce, "Certificates of Origin," <https://iccwbo.org/resources-for-business/certificates-of-origin/> (Accessed June 2017).
14. Whether a BOL is required can be found in the World Bank's "Ease of Doing Business" database. Documents needed for import and export are listed for each country in its respective country profile, see for example, "Details – Trading across Borders in Afghanistan – Trade Documents," http://www.doingbusiness.org/en/data/exploreeconomies/afghanistan#DB_tab. For the 2019 update, points were changed for: Burkina Faso, Burundi, Jordan, Mali, Oman, Singapore, Morocco, Chad, Finland, Israel, Japan, Maldives, New Zealand, Palau, Qatar, Rwanda, and the UAE.
15. "Definition of 'Bill of Lading,'" *The Economic Times*, <https://economictimes.indiatimes.com/definition/bill-of-lading> (Accessed November 2017).

16. Property Rights Alliance, *The Intellectual Property Rights Index 2016*, <http://ec2.digitalliberty.net/>. Individual country scores are published in the index.
17. Congressional Research Service, *U.S.-Vietnam Nuclear Cooperation Agreement: Issues for Congress*, September 15, 2014, <https://fas.org/sgp/crs/nuke/R43433.pdf>
18. See indicator 4.2 “Domestic Nuclear Materials Security Legislation,” sub-indicator 4.2.2 “National legal framework for CPPNM,” by Nuclear Threat Initiative and The Economist Intelligence Unit, “EIU Methodology,” *NTI Nuclear Security Index*, 2018.

CHAPTER 4

SUPER CRITERION ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Super Criterion Ability to Monitor and Detect Strategic Trade assesses the mechanisms that allow a state to monitor and control strategic or sensitive trade, and the hospitability of the state environment to achieving the mission. It focuses mostly on tangible outcomes under 19 sub-criteria, rather than simply on the theoretical abilities of a country, by factoring in various performance metrics or views about performance such as statistics, surveys, expert observations, and rankings conducted by other non-governmental organizations or international organizations. For example, quantitative assessments about countries' relative governmental transparency, internal stability, and customs diligence are included. These factors can significantly add to or take away from a country's ability to monitor and detect strategic trade.

This super criterion is one of the most challenging for countries to score highly on as it measures tangible outcomes rather than pledges or intentions made in treaties or laws. It measures under the 19 sub-criteria actions, efficiencies, transparencies, and stability. Most countries can only improve their performance under this super criterion through systematic and long-term improvements. Of the 19 sub-criteria, five are considered low-impact, ten are medium-impact, and four are high-impact. They are worth 5, 10, and 15 points, respectively.

A country could receive a total of 185 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

SUB-CRITERIA^{1,2}:

- Has ability to track and trace consignments³**

The 2016 Logistics Performance Index produced by the World Bank provides a score for countries on their ability to track and trace consignments. Countries with higher scores under “tracking and tracing” demonstrate a greater capacity to perform this function, which indicates a country’s capacity to monitor and control the movement of strategic goods inside and outside of the country. As such, this indicator is given a high impact.

- Percentage of import shipments physically inspected⁴**

The 2016 Logistics Performance Index by the World Bank also estimates the percentage of import shipments that are inspected in each country. While inspecting each container or every shipment is not practical, random inspections and inspections of known strategic commodity shipments are necessary to effectively monitor the transit of potentially sensitive shipments and detect illicit activity. This is a high-impact sub-criterion.

- Percentage of import shipments physically inspected multiple times⁵**

The 2016 Logistics Performance Index estimates the percentage of shipments that are physically inspected multiple times by each country. The World Bank finds multiple inspections to be a poor means of policing imports because it renders the entire customs system inefficient; on the other hand, the PPI found that multiple inspections increase the chances that a sensitive commodity will be detected in transit. This sub-criterion allows countries that are weak in their *Ability to Monitor and Detect Strategic Trade* a chance to attain points. It is assessed as high-impact.

- New: Use of electronic export declarations⁶**

This sub-criterion draws on a combination of information from the World Customs Organization annual report. The PPI uses the number

of export declarations, the number of electronic export declarations, and the percentage of electronically filed export declarations to determine if a country has rigorous and modern export control mechanisms. Strong and modern export control mechanisms make it easier for countries to monitor strategic trade and detect illicit imports and exports; therefore, it is categorized as a high-impact sub-criterion.

- **Use of automated customs system⁷**

Having an automated or electronic customs system, versus one that uses paper documents, typically indicates a more efficient and advanced customs system. It usually implies that a country inspects packages or cargo based on information about shipments that optimizes inspections using a risk-based approach. A majority of countries use automated customs systems, particularly since the UN Conference on Trade and Development started to promote and assist with the implementation of its ASYCUDA (Automated System for Customs Data) software. The PPI collected information for each country individually. The PPI did not discern that certain types of electronic systems are better or worse. It is a medium-impact sub-criterion.

- **Ease of starting a business⁸**

Countries that make starting a business straightforward generally have a transparent and well-regulated process in place, such as obtaining legitimate licenses and documents. The PPI assessed that countries with such a process in place may be less likely to have companies engaged in illicit activities. The World Bank ranks 190 countries on the ability to start a business. This is a medium-impact sub-criterion.

- **World Economic Forum Ranking⁹**

This ranking is taken from the Global Enabling Trade Report for 2016, produced by the World Economic Forum. The report ranks 136 countries on their ability to provide “faster and more efficient customs procedures through effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. It also contains provisions for technical assistance and capacity building.” These provisions are outlined in the World Trade Organization’s Trade Facilitation Agreement. States with a higher rank are more likely to have

implemented such provisions and have a broader capacity to monitor and detect illicit trade. This is a medium-impact sub-criterion.

- **Efficiency of customs clearance process¹⁰**

As part of the World Economic Forum's Global Enabling Trade Report for 2016, countries were given a score for the efficiency of their customs clearance process on a scale from 1 to 5, with 5 being the most efficient. Countries with efficient clearance processes have the mechanisms in place to clear imports and exports, and thus, would be more likely to have trained and knowledgeable customs officials able to identify illicit imports and exports. This is a medium-impact sub-criterion.

- **Internal stability/Absence of violence/terrorism – World Bank estimate¹¹**

Countries that are described by the World Bank as more stable and have a smaller presence of violence and terrorism are correlated by the PPI as more able to effectively implement mechanisms to monitor exports and imports and detect illicit activity. These processes and related organizations are less likely to be negatively influenced by corruption, high official turnover, and other disrupting factors. The World Bank 2017 Worldwide Governance Indicator on internal stability and absence of violence/terrorism is used to calculate points for this sub-criterion. It is assigned a medium impact.

- **Government Outreach (three separate sub-criteria under this heading)¹²**

To prevent strategic commodities from being mistakenly or purposefully exported to sanctioned or nefarious end-users, government agencies must conduct outreach to train and inform officials at companies about the country's laws and procedures for licensing, as well as on detecting and preventing illicit procurement attempts. Government agencies should also have a point of contact to deal with Resolution 1540 implementation. Countries with greater outreach efforts are more likely to effectively monitor and detect illicit trading activity. The 1540 Committee's 2015 matrix includes resources that would be needed to carry out such checks, and information about countries' implementation of these sub-criteria. Points are assigned separately for the following three sub-criteria:

- State works with and informs industry about strategic trade
- State works with and informs the public about strategic trade
- State has point of contact for 1540 implementation

Each of these three sub-criteria is assigned a medium impact by the PPI, but they could be considered high-impact in future versions.

- **Party to the Convention on Transit of Land-locked States/Party to the UN Convention on the Law of the Sea¹³**

These two conventions are taken as a single sub-criterion. They have similar provisions regarding transshipment regulations. They are relevant for the PPI since they add clarity to countries' legal responsibilities and rights regarding the transport of goods through one or more countries. According to the Convention on the Law of the Sea, Article 125 *Right of access to and from the sea and freedom of transit*:

1. *Land-locked States shall have the right of access to and from the sea for the purpose of exercising the rights provided for in this Convention including those relating to the freedom of the high seas and the common heritage of mankind. To this end, land-locked States shall enjoy freedom of transit through the territory of transit States by all means of transport.*
2. *The terms and modalities for exercising freedom of transit shall be agreed between the land-locked States and transit States concerned through bilateral, subregional or regional agreements.*
3. *Transit States, in the exercise of their full sovereignty over their territory, shall have the right to take all measures necessary to ensure that the rights and facilities provided for in this Part for land-locked States shall in no way infringe their legitimate interests.*

Additionally, the Convention on the Law of the Sea introduces language in Article 25 that gives transit countries the legal authority for interdicting cargo. Specifically, the coastal state (transit country) may "take the necessary steps in its territorial sea to prevent passage which is not innocent." This language could be used as a basis to learn more about shipments of strategically-controlled goods.

This sub-criterion is of medium impact.

- **New: Interagency review required for licensing transfers of nuclear weapons-related materials¹⁴**

Legislation requiring interagency review for licenses and licensing regulations regarding “border crossings, export/import and other transfers” of nuclear weapons and related materials¹⁵ ensures that they are consistent and compatible across multiple agencies and that there are not duplicate policies that slow down or confuse the process. Countries with legislation that requires interagency review of licenses can better monitor licenses given out and nuclear-related trade in general. This is a medium-impact sub-criterion.

- **Logistics Performance Index Rank¹⁶**

The PPI took into account a country’s overall ranking in the World Bank’s 2016 Logistics Performance Index. In addition to measuring countries’ Tracking and Tracing of shipments, the World Bank measures a country’s logistics performance through evaluating such indicators as Customs, Infrastructure, International shipments, Logistics competence, and Timeliness. It is a low-impact sub-criterion.

- **Level of state control of the economy¹⁷**

The Heritage Foundation’s Index of Economic Freedom for 2018 measures the level of state control of the economy, or “economic freedom,” based on 12 factors in four categories: Rule of Law (property rights, government integrity, judicial effectiveness); Government Size (government spending, tax burden, fiscal health); Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and Open Markets (trade freedom, investment freedom, financial freedom). These pillars support an efficient and reliable trade control system. Since they support, but do not guarantee efficiency and reliability, this indicator was judged by the PPI as having a low impact on overall *Ability to Monitor and Detect Strategic Trade*.

- **New: Percentage of firms that export directly or indirectly¹⁸**

The percentage of firms that export directly and indirectly at least one tenth of their total sales is used as an indirect measure of a government’s knowledge of its supply potential. A low percentage of firms that export more than ten percent of their total sales reduces the number of suppliers of potentially sensitive goods. This, in turn, may make it easier for the

government to conduct industry outreach, as well as to detect and prevent the existence and activities of shell companies. Indirect exporting means that a firm uses a third party to sell its products. The firm has little to no involvement in the export process. Direct exporting means the firm sells and exports its product directly to a customer. In this case, the firm is responsible for exporting the product. This score measures the fraction of potential exporting suppliers in a country, where a low fraction is rewarded. This is a low-impact sub-criterion.

- **New: A low number of documents is required to import¹⁹**

The 2017 and 2019 PPI use the sub-criterion “A low number of documents is required for exports” under Super Criterion *Adequacy of Enforcement*. The similar criterion for imports is suggestive of an orderly import process that better detects the transit of strategic goods into a country or being shipped through a country. Fewer documents means the country’s import process is more streamlined. This is a low-impact sub-criterion, since it relates to the ease of transporting goods into or through a country.

- **New: Registration is required for a company to export goods or to apply for an export license for controlled goods²⁰**

A country may require registration before a company can make any exports, or at least, before it can apply for an export license to transfer controlled goods. Such procedures help avoid the creation of shell companies and prevent illicit exports and eventual transshipment of strategic goods. Ideally, the PPI sought to assign points only for countries that require a company to register specifically as a dual-use supplier. However, this information was difficult to find for many countries, and it is a step that may occur later in the export registration or license application process. This is a low-impact sub-criterion.

IMPACT OF SUB-CRITERIA:

The PPI assigned a low to high impact for weighting each of the sub-criteria. **Table 4.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country’s score and rank within the super criteria.

SCORING:

Of the 19 sub-criteria, five are considered low-impact, ten medium-impact, and four high-impact. They are worth 5, 10, and 15 points, respectively, leading to a total of 185 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

HIGH-IMPACT (4)
Ability to track and trace consignments
Percentage of import shipments physically inspected
Percentage of shipments physically inspected multiple times
Use of electronic export declarations
MEDIUM-IMPACT (10)
Use of automated customs system
Ease of starting a business
World Economic Forum Ranking
Efficiency of customs clearance process
Internal stability
Government Outreach: State works with and informs industry
Government Outreach: State works with and informs the public
Government Outreach: State has point of contact for 1540
Convention on Transit of Land-locked States/UN Convention on Law of the Sea
Interagency review required for licensing exports of nuclear weapons-related materials
LOW-IMPACT (5)
Logistics Performance Index Rank
Level of state control of the economy
Percentage of firms that export directly or indirectly (at least 10 % of their total sales)
A low number of documents is required to import
Registration required for a company to export goods or to apply for a license to export dual-use goods

Table 4.1. The impact of each sub-criterion under Super Criterion *Ability to Monitor and Detect Strategic Trade*.

NOTES

1. Project staff considered additional sub-criteria but were unable to find enough information, so they were not included in scoring: 1) Existence of an export control fusion center or similar, which enables interagency cooperation in export control-related matters; 2) Licensing officials and authorities conduct industry outreach; 3) Level of customs awareness and involvement in strategic trade control; and 4) Existence of national databases containing cases of nuclear-related trafficking that were detected or prosecuted by authorities.
2. The 2019 PPI removed one indicator, “Lack of denied parties by United States and the European Union,” due to the sub-criterion’s use in Super Criterion *Adequacy of Enforcement*. This edition of the PPI added five new sub-criteria: “Percentage of firms that export directly or indirectly at least ten percent of their total sales,” “Registration required for a company to export or to apply for a license,” “Number of documents required to import,” “Interagency review required for licensing of exports of nuclear weapons-related materials,” and “Strength of export control mechanisms per World Customs Organization data.”
3. The World Bank, “Global Rankings 2016,” *Logistics Performance Index*, 2016, <https://lpi.worldbank.org/international/global>
4. “Global Rankings 2016.”
5. Ibid.
6. World Customs Organization, “Annual Report 2017-2018,” http://www.wcoomd.org/-/media/wco/public/global/pdf/media/annual-reports/annual-report-2017_2018.pdf
7. UN Conference on Trade and Development, “ASYCUDA – User Countries,” <https://asycuda.org/user-countries/>; internet searches. For the 2019 PPI, points were corrected for Algeria. Equatorial Guinea newly received points.
8. The World Bank, “Starting a Business,” *Doing Business: Measuring Business Regulations*, June 2017, <http://www.doingbusiness.org/data/exploretopics/starting-a-business>
9. World Economic Forum, “The Global Enabling Trade Report 2016,” http://www3.weforum.org/docs/WEF_GETR_2016_report.pdf
10. Ibid. The scores can be found in the individual country profiles under the report’s discussion of Pillar 3: Efficiency and transparency of border administration.
11. The World Bank, “Worldwide Governance Indicators,” *DataBank: Series: Political Stability and Absence of Violence/Terrorism Estimate*, 2017, <http://databank.worldbank.org/data/reports.aspx?source=worldwide-governance-indicators>
12. 1540 Committee Approved Matrices, Dated December 23, 2015, <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>

CHAPTER 4

13. United Nations Treaty Collection, *Convention on Transit Trade of Land-locked States*, New York, July 8, 1965, updated June 11, 2017, https://treaties.un.org/pages/viewdetails.aspx?src=treaty&mtdsg_no=x-3&chapter=10&lang=en; United Nations Division for Ocean Affairs and the Law of the Sea; *United Nations Convention on the Law of the Sea*, December 10, 1982, http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf
14. United Nations 1540 Committee, “Committee Approved Matrices,” <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. Found in OP3 c and d, row 12. Of note, the corresponding cell is missing in the committee-approved matrix template for future rounds of publications. It is not clear to us yet whether the information will be reported elsewhere in the matrix.
15. The UN 1540 Committee defines “related materials” in the matrices as: “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.”
16. The World Bank, “Global Rankings 2016,” *Logistics Performance Index*, 2016, <https://lpi.worldbank.org/international/global>
17. Chapter 1 in Terry Miller, Anthony B. Kim, and James M. Roberts, “Economic Freedom: Policies for Prosperity,” *2018 Index of Economic Freedom* (Washington, D.C.: Heritage Foundation, 2018), https://www.heritage.org/index/pdf/2018/book/index_2018.pdf
18. The World Bank, “Trade,” 2017, <http://www.enterprisesurveys.org/data/exploretopics/trade#—1>
19. The World Bank, “Documents to Import (number),” 2014, <https://data.worldbank.org/indicator/IC.IMP.DOCS?end=2014&start=2014&view=map>
20. Individual internet searches.

CHAPTER 5

SUPER CRITERION ABILITY TO PREVENT PROLIFERATION FINANCING

Super Criterion Ability to Prevent Proliferation Financing evaluates a country's ability to prevent Financing of Proliferation, a relatively new approach to detecting and preventing strategic commodity trafficking. This super criterion uses evaluations conducted by the Financial Action Task Force (FATF), the major international organization seeking to establish standards and assess efforts at preventing money laundering and other financial crime. Early in the 2017 PPI sub-criteria development process, experts with knowledge of proliferation financing advised the project on the most relevant FATF-collected data. In addition to FATF data, the super criterion *Ability to Prevent Proliferation Financing* utilizes real world measures and information about countries' susceptibility to being exploited or involved in proliferation financing, such as the size of a country's black market. Of note, it is the super criterion under which countries collectively performed the worst. Moreover, this super criterion offers the fewest sub-criteria for measuring countries' performance because of a lack of data involving this newer approach.

This super criterion first *assigns* points to countries based on sub-criteria derived mostly from the FATF determinations. These sub-criteria assess countries' theoretical capabilities to prevent money laundering and proliferation financing based on their financial regulatory systems and

counter-illicit financing programs. These twelve sub-criteria are characterized as “positive indicators.” The PPI then *takes away* points according to five “negative indicator” sub-criteria, or concrete information and examples of poor controls, such as when countries are known to have been involved in money laundering, have high amounts of illicit money outflow, or have entities on the U.S. Treasury Department’s Office of Foreign Assets Control (OFAC) List of Specially Designated Nationals and Blocked Persons (SDN). The positive and negative indicators are assigned a low, medium, or high impact for scoring purposes. The project next assigns or takes away available “extra credit” points according to three other FATF-related sub-criteria. Finally, the judgment of experts in proliferation financing who were consulted for the PPI is used to take away or assign points based on their knowledge of proliferation financing in certain countries. Of the 12 positive sub-criteria, one is considered low-impact, nine are medium-impact, and two are high-impact. They are worth 5, 10, and 15 points, respectively. Absent extra credit and expert knowledge points, a country could receive a total of 125 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

Overall, there is little international effort devoted to assessing proliferation financing, which is why the PPI relies heavily on FATF evaluations. However, much of the FATF’s information applies to broader illicit financing activities rather than specifically to proliferation financing. FATF only added language on proliferation financing in 2012, and only to two out of forty FATF recommendations.¹ Since then, FATF evaluations include looking at countries’ theoretical ability to implement international financial sanctions and at the effectiveness of its controls against those countries under international financial sanctions, including investigation and enforcement actions. However, not all countries have undergone a FATF mutual evaluation process since the 2012 recommendations were introduced. Therefore, these evaluation data were only available for a limited number of countries. That is why the PPI decided to factor in the other point addition and subtraction categories.

POSITIVE INDICATORS^{2,3}:

- **Compliance with selected FATF recommendations**

The FATF provides the most data regarding a country's banking regulations and practices. FATF's objectives are to set standards and promote effective implementation of legal, regulatory, and operational measures for combating money laundering, terrorist financing, and other related threats to the integrity of the international financial system. It publishes a periodically updated set of recommendations that all member countries should follow to prevent financial crimes and publishes evaluations of individual countries' compliance with each recommendation. Evaluations are conducted by the FATF or its regional bodies, and are titled "Mutual Evaluation Reports." For each recommendation, potential deficiencies are listed, and a final conclusion is drawn, which can be that the country is Not Compliant, Partially Compliant, Largely Compliant, or Compliant with the specific recommendation. With the emergence of additional threats to the international financial system, including terrorist financing, and subsequently proliferation financing, the FATF recognized the need to update its recommendations in 2003, and again in 2012. The mutual evaluation reports based on 2003 guidelines versus 2012 guidelines often number their recommendations differently, and as a result, the PPI lists a recommendation and its associated year, such as FATF Recommendation 2 (2012), meaning it is the one from the 2012 guidelines. As of February 2019, 63 countries have undergone an evaluation based on the 2012 standards.⁴ To establish common ground between countries that have undergone a FATF evaluation before and after 2012, the PPI took into consideration recommendations found in both the new and old guidelines, and used data only found in the new round of evaluations for the extra credit indicators. The following FATF recommendations (FATF R.'s) have been carefully evaluated and selected by consulting financing of proliferation experts as most relevant to preventing proliferation financing, based on their experience with what governments need the most to prevent this illicit activity⁵:

- **FATF Recommendation 2 (2012) 31 (2003) National Coordination:**⁶ "Countries should have national [anti-money laundering/counter-terrorist financing] policies [...]. Countries should ensure that [...] relevant competent authorities, at

the policymaking and operational levels, have effective mechanisms in place which enable them to cooperate, and, where appropriate, coordinate domestically with each other concerning the development and implementation of policies and activities to combat money laundering, terrorist financing and the financing of proliferation of weapons of mass destruction.” This is a high-impact indicator.

- **FATF Recommendation 40 (2012 and 2003) International Cooperation / Other Forms of Cooperation:** “Countries should ensure that their competent authorities can rapidly, constructively, and effectively provide the widest range of international cooperation in relation to money laundering, associated predicate offences and terrorist financing.” This is a high-impact sub-criterion.
- **FATF Recommendation 10 (2012) 5 (2003) Customer Due Diligence (CDD):** “Financial institutions should be prohibited from keeping anonymous accounts or accounts in obviously fictitious names. [...] The principle that financial institutions should conduct CDD should be set out in law. [...] Financial institutions should be required to verify the identity of the customer and beneficial owner before or during the course of establishing a business relationship or conducting transactions for occasional customers.” This is a medium-impact indicator.
- **FATF Recommendation 13 (2012) 7 (2003) Correspondent Banking:** Financial institutions should collect additional information before conducting cross-border correspondent banking, and they “should be prohibited from entering into, or continuing, a correspondent banking relationship with shell banks.” It is a medium-impact sub-criterion.
- **FATF Recommendation 26 (2012) 23 (2003) Regulation and Supervision:** Financial institutions should be licensed, registered, regulated, and subject to monitoring. “[...] Countries should not approve the establishment, or continued operation, of shell banks.” This is a medium-impact sub-criterion.
- **FATF Recommendation 30 (2012) 27 (2003) Law Enforcement Responsibilities:** “Countries should ensure that designated law enforcement authorities have responsibility for money laundering and terrorist financing investigations [...].” This is a low-impact indicator.

The PPI assigned up to 65 raw points based on country compliance with this selected set of FATF recommendations, which encapsulate critical elements or essential features of a system that prevents proliferation financing.

- **Unavailability of trade financing**

The World Economic Forum, as part of its 2016 Global Enabling Trade Index, measures how easily a business can finance trade at an affordable cost, based on conducted Executive Opinion Surveys. According to the World Economic Forum definition, the cost of financing trade includes trade credit insurance and trade credit, such as letters of credit, bank acceptances, advanced payments, and open account arrangements. Countries are ranked out of 136, with 1 being the easiest country in which to obtain trade financing and 136 being the most difficult. For the PPI, this is a low-impact indicator used to assess how attractive a country is as an illicit finance hub. In other words, the *unavailability* of trade finance can be a small deterrent to proliferation financing.⁷

The reasons for this include: 1) 80 percent of trade financing takes place through “open accounts,” i.e. wire transfers, so the unavailability of trade finance can render only 20 percent of all transactions in a country susceptible to illicit financing activities;⁸ 2) Trade financing applies mainly to countries at the origin and end point of transactions and not to countries in-between, limiting the opportunities for exploitation; and 3) State-sponsored proliferation networks are likely willing to dedicate more financial resources than profit-seeking businesses, which could make unavailability of trade financing a deterrent because of the additional time, documentation, and paper trail required. Many developing countries have such an unavailability of trade financing, but surprisingly, also some small, developed countries, such as Lithuania or Portugal, have an unavailability of trade financing. Greater availability of trade financing is seen in common trading hubs such as Hong Kong and Malaysia, but also in smaller, inconspicuous countries such as Malta, Oman, and Bahrain. It is a medium-impact indicator.

- **Low average illicit financial outflows as percentage of total trade⁹**

This indicator measures illicit financial outflows from developing countries over the period 2005-2014. Data are collected and published by Global Financial Integrity. According to the organization:

Illicit outflow [...] is money illegally earned, transferred, and/or utilized. Some examples of illicit financial outflows listed might include:

- *A drug cartel using trade-based money laundering techniques to mix legal money from the sale of used cars with illegal money from drug sales;*
- *An importer using trade misinvoicing to evade customs duties, value added taxes (VAT), or income taxes;*
- *A corrupt public official using an anonymous shell company to transfer dirty money to a bank account in the United States;*
- *A human trafficker carrying a briefcase of cash across the border and depositing it in a foreign bank; or*
- *A terrorist wiring money from the Middle East to an operative in Europe.*

This sub-criterion measures one aspect of the inadequacy of national financial oversight and is indirectly related to proliferation financing. It is deemed a medium-impact indicator. Data are presented not in absolute dollars but as percent range of total country trade. The low end of the estimated outflow range was used. Countries are awarded more points for not having a large percentage of cumulative illicit outflows.

• **Country has FATF or FATF Regional Body Membership¹⁰**

The FATF has established eight regional bodies to promote global dissemination and coordination in order to promote better understanding and implementation of its international standards, as highlighted in the FATF 40 (49 for post-2003) recommendations. Most countries are either FATF members or members of a FATF-style regional body. Some are members of both. The level of organization and dynamic varies within the different groups. Before being able to become a FATF member, countries undergo a rigorous review process. FATF membership is awarded more points than regional body membership. The regional bodies are:

- The Eurasian Group (EAG)
- Asia/Pacific Group (APG)
- Caribbean Financial Action Task Force (CFATF)

- Committee of Experts on the Evaluation of Anti-Money Laundering Measures and the Financing of Terrorism of the Council of Europe (MONEYVAL)
- Eastern and Southern Africa Anti-Money Laundering Group (ESAAMLG)
- Financial Action Task Force on Latin America (GAFILAT)
- Intergovernmental Action Group Against Money Laundering in West Africa (GIABA).
- Middle East and North Africa Financial Action Task Force (MENAFATF)
- The Task Force on Money Laundering in Central Africa (GABAC)

This is a medium-impact indicator.

- **FATF compliance score¹¹**

The FATF compliance score is available for 112 jurisdictions (98 of which are evaluated by the PPI) on the 2018 Financial Secrecy Index (FSI), published by the Tax Justice Network. In the FSI, FATF compliance is indicator 17, “Anti-Money Laundering.” According to the FSI report, compliance with all available recommendations (49 recommendations post-2003, or 40 recommendations plus 11 Immediate Outcomes post-2012) was calculated as a percentage of compliance with the recommendations, where a 100 percent score rating indicates that all recommendations have been rated as “non-compliant” or “low level of effectiveness,” whereas a 0 percent rating indicates that the jurisdiction is “entirely compliant/highly effective.”¹² In line with this, the PPI assigned points inversely proportional to a country’s percentage score. Working with FATF to comply with general recommendations by implementing regulations and best practices is the first step for a country to prove its full commitment to financial transparency and anti-money laundering efforts. Despite some degree of duplication with the FATF recommendations above, this is a good indicator of general ability to prevent financial crimes. This is a medium-impact indicator.

- **New: Public Registry of Company Beneficial Ownership¹³**

Having a public registry of companies and their beneficial ownership helps ensure that front companies and shell companies cannot exist and operate. Transparency is important in countering proliferation, and therefore beneficial ownership information should be made public. Not many countries have a public registry of companies, but several countries have an internal list for law enforcement and other purposes. Ideally, a list should be public and legislators should consider requiring more concrete beneficial ownership information. This is a medium-impact sub-criterion.

- **New: Member of the Egmont Group¹⁴**

The Egmont Group works to prevent money laundering and terrorist financing by providing a secure space for the exchange of financial intelligence. It is made up of 155 “Financial Intelligence Units” from various countries. It works to support the international efforts of the UN Security Council and FATF at combatting money laundering and terrorist financing. This is a medium-impact sub-criterion.

VARIABILITY IN FATF COMPLIANCE EVALUATIONS

During the 2017 vetting process for the *Proliferation Financing* sub-criteria, the PPI noted that, for an accurate ranking, it cannot rely only on data extracted from FATF mutual evaluation reports. The PPI found that the way compliance judgments are made is not standardized throughout the regional FATF bodies. While some FATF bodies appear very strict and require that all deficiencies are removed before awarding a country with the two highest levels of compliance (largely compliant and compliant), other evaluating bodies seem to be more generous in assigning compliance levels. For example, the PPI found that the European regional FATF body tended to be harsher in its assessments. The CFATF, or Caribbean regional body, and GAFILAT, or Latin American regional body, seemed more generous in their assessments.¹⁵

Additionally, compliance judgments published in follow-up FATF reports, for example, are derived based on a less rigorous evaluation process than the full reports. In follow-up reports, self-reporting plays a much greater role.¹⁶

NEGATIVE INDICATORS:

Because the number of positive sub-criteria based on FATF information is already relatively low and FATF information is not complete, an additional set of negative indicators was added to more effectively rank countries under this super criterion. These sub-criteria focus on negative outcomes, such as the existence of substantial black markets in countries or countries having sanctioned entities. A negative sub-criterion means that points are subtracted instead of added. Ten or 15 points are subtracted for a negative performance under these indicators since they are all medium or high-impact. In 2019, the maximum points deduction under one of the negative sub-criteria, *Presence of denied parties by United States*, dropped from 60 to 15, since only one sanctions list was used to deduct points, instead of four. Due to this change, many countries' overall scores improved in their *Ability to Prevent Proliferation Financing*.

- **Presence of denied parties by United States¹⁷**

Countries with entities on the U.S. Office of Foreign Assets Control (OFAC) Specially Designated Nationals and Blocked Persons (SDN) List likely failed to detect illicit activity until after it occurred. While entities are added as a penalty for a range of U.S. foreign policy and national security reasons, entities on the list include, among others, “those engaged in activities related to the proliferation of weapons of mass destruction.”¹⁸ It is measured as a negative indicator with high impact, since it indicates actual instances where illicit activities have been detected.

- **Appearance on the 2018 State Department List of Countries posing Money Laundering and Financial Crime concerns¹⁹**

The State Department Bureau for International Narcotics and Law Enforcement Affairs identifies in its March 2018 report “Countries/Jurisdictions of Primary Concern” for “Money Laundering and Financial Crimes.” Using country profiles, the report points out weaknesses in those countries’ enforcement or justice systems which pose challenges to the implementation of financial regulations. Examples of observed implementation challenges include “limited resources, lack of technical expertise, and poor infrastructure” as well as “administrative hurdles” and “corruption.” This sub-criterion is medium-impact.

- **Worldwide Biggest Black Markets ranking²⁰**

This indicator is a ranking of the world's 93 biggest black markets published by Havoscope, measured by their size in U.S. dollars. Black markets are linked to proliferation financing because they facilitate the financing of illicit procurement of strategic commodities. It is a medium-impact sub-criterion.

- **Significant average illicit financial outflows as percentage of total trade²¹**

This indicator again uses data collected and published by Global Financial Integrity, measuring average illicit financial outflows from developing countries over the period 2004-2013. This includes "deliberate trade misinvoicing (gross excluding reversals or GER) and leakages in the balance of payments (hot money narrow or HMN)." The PPI decided that significant illicit financial outflows should be penalized. Points are taken off for countries that had an average of more than five percent in illicit financial outflows from 2004-2013. Data are only collected for developing countries, which is in a sense useful as it balances out points that countries may have undeservedly received for one of the positive indicators: having unavailable trade financing. As above, it is a medium-impact indicator.

- **Lack of influence of corruption²²**

Corruption can interfere significantly in the implementation of financial controls and their implementation. Companies engaged in exporting may believe they can simply ignore any legal export or financial requirements if they believe there is little likelihood of being investigated or prosecuted. Corruption would likely inhibit strong financial controls and enforcement. For this sub-criterion, the 2017 Corruption Perceptions Index (CPI) by Transparency International is used as a measure for corruption in 180 countries. This index was selected from a variety of corruption measures and indices, mainly because this index lists the most countries and is widely respected. The PPI used the rank of a country in the CPI to assign points, rather than its score derived by Transparency International. The points in this sub-criterion were assigned in an inversely proportional way to their relative rank. If the country or entity did not appear on the CPI, it was not assigned points. This sub-criterion has a medium impact.

“EXTRA-CREDIT” OPPORTUNITIES:

For the 63 countries that were evaluated according to post-2012 FATF standards, the PPI offered three “extra credit opportunities,” which allowed for the addition (or in a few cases the subtraction) of points. Information on those countries is included in the PPI scoring because the 2012 standards are of higher relevance than the previous sets of recommendations. For the first time, a recommendation specifically addresses a country’s ability to implement targeted financial sanctions related to proliferation as laid out under relevant UN Security Council resolutions. Because of the direct relevance and importance of these post-2012 evaluations, the PPI adjusted its methodology to include the data in a way that did not punish the other 137 countries. Therefore, the above-mentioned 63 countries were able to obtain extra points (or suffer subtractions) on top of the 125 total possible points. Nevertheless, countries should undergo mutual evaluations on a regular basis, and make it a priority if they have not done so recently.

EXTRA CREDIT INDICATORS:

- Compliant or largely compliant with FATF Recommendation 7 (2012)²³

FATF recommendation 7 (2012) refers to implementation of targeted financial sanctions related to proliferation. It states, “Countries should implement targeted financial sanctions to comply with United Nations Security Council resolutions relating to the prevention, suppression and disruption of proliferation of weapons of mass destruction and its financing. These resolutions require countries to freeze without delay the funds or other assets of, and to ensure that no funds and other assets are made available, directly or indirectly, to or for the benefit of, any person or entity designated by, or under the authority of, the United Nations Security Council under Chapter VII of the Charter of the United Nations.” A compliant or largely compliant score for R. 7 would allow a country to receive ten or five additional points, respectively.

- **FATF Immediate Outcome (IO) 11: Proliferation financial sanctions²⁴**

Immediate Outcome 11 states, “Persons and entities involved in the proliferation of weapons of mass destruction are prevented from raising, moving and using funds, consistent with the relevant UNSCRs.” As such, IO 11 also refers to implementation of targeted financial sanctions related to proliferation. IO 11 is measured in terms of a low, moderate, substantial, or high level of effectiveness, where a country only received points for “substantial” or “high.” Examples of outcomes evaluated by the FATF are concrete actions that have been taken, including investigations and prosecutions relating to sanctions. A substantial or high rating for IO 11 allows a country to gain five or ten points, respectively. Of note, in all currently available mutual evaluation reports including IO 11, only two countries have received a “high” rating.

- **Effectiveness of National Coordination: FATF Immediate Outcome 1 (IO 1)²⁵**

FATF Immediate Outcome 1 requires, “[...] where appropriate, actions [are] coordinated domestically to combat money laundering and the financing of terrorism and proliferation.” The creation or involvement of relevant authorities, assessment of necessary policies, implementation of said policies, and cooperation between any and all relevant authorities are necessary to combat those three types of financial crime. IO 1 is measured in terms of low, moderate, substantial, or high effectiveness. This sub-criterion is extra credit as well as a penalty. Five points were given if a country achieved “substantial” and ten points for “high” effectiveness, but five points were deducted if a country achieved “low” effectiveness. Of note, in all currently available mutual evaluation reports including IO 1, only one country has received a “high” rating.

EXPERT JUDGMENT:

One final modification to the super criterion score resulted from extensive expert discussions. The PPI considered the fact that there may be missing data relevant to the sub-criteria and experts often have the best, first-hand information about a country performing significantly better or worse than scored. In some cases, experts judged that a country had

received too many or too few points based on real-world knowledge and information. About 16 countries were affected by this evaluation.

IMPACT AND FLOW CHART OF SUB-CRITERIA:

The PPI assigned a low to high impact for weighting each of the positive and negative sub-criteria. **Table 5.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country's score and rank within the super criteria. The steps of the process are indicated in the flow chart where negative indicators take away points, extra credit takes away or adds points, and expert judgment is factored in.

SCORING:

The *Ability to Prevent Proliferation Financing* super criterion incorporates 12 positive sub-criteria, five negative sub-criteria, three extra credit opportunities, and finally expert judgment, where countries could receive or lose additional points. The positive and negative sub-criteria are evaluated in terms of low, medium, or high impact. Of the 12 positive sub-criteria, one is considered low-impact, nine are medium-impact, and two are high-impact. They are worth 5, 10, and 15 points, respectively. Of the five negative sub-criteria, four are medium-impact and one is high-impact. Absent extra credit and expert knowledge points, a country could receive a total of 125 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

The pie chart below (Figure 5.1) shows the fraction of countries that have scores exceeding fifty percent of the total, between fifty percent and twenty five percent of the total, less than 25 percent down to a score of 0, and below a score of 0. Only 11 countries received more than half of the available points. About 41 of all countries achieved negative scores. While 32 countries received a new FATF mutual evaluation report since the 2017 PPI, which can be a significant source of new PPI points, we also made a methodological change in the point subtractions, which contributed greatly to the reduction of countries with negative scores.

OBSERVATIONS

Through PPI research and consulting with experts, an overriding conclusion is that most countries do not do well on preventing proliferation financing. Many of the usual “white knights” do poorly due to having excessive bank secrecy, providing tax havens, and being places where front companies find it easier to finance nefarious activities. Other countries simply lack regulations and effective institutions.

2019 Countries' score distribution in Super Criterion Ability to Prevent FoP

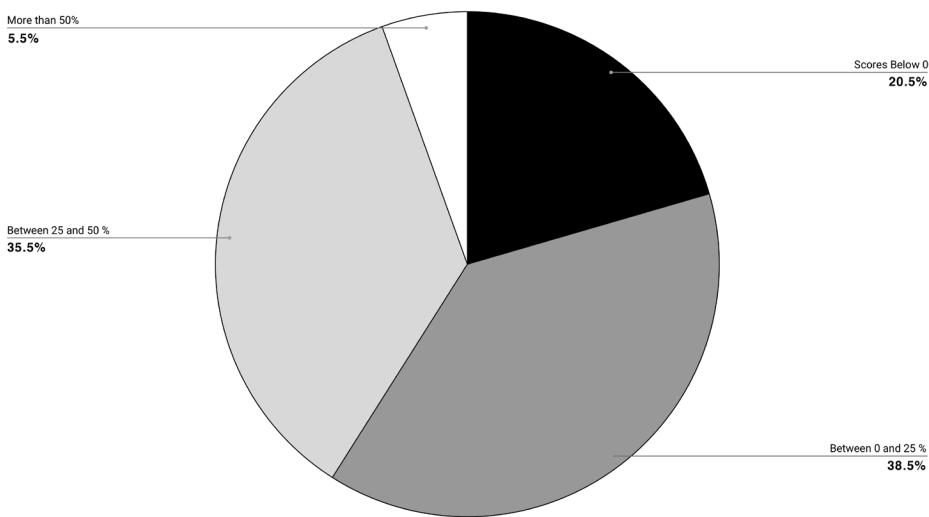


Figure 5.1. The pie chart shows the score distribution of countries in their *Ability to Prevent Proliferation Financing*. More than half the countries score less than 25 percent of the available points.

SUPER CRITERION ABILITY TO PREVENT PROLIFERATION FINANCING

<i>Positive indicators (points are added):</i>		
High-Impact (2)	Medium-Impact (9)	Low-Impact (1)
FATF R. 2 (2012) 31 (2003) National Coordination	(Un)availability of trade finance	FATF R. 30 (2012) 27 (2003) Law Enforcement Responsibilities
FATF R. 40 (2012 and 2003) International Cooperation / Other Forms of Cooperation	FATF R. 10 (2012) 5 (2003) Customer Due Diligence	
	FATF R. 13 (2012) 7 (2003) Correspondent Banking	
	FATF R. 26 (2012) 23 (2003) Regulation and Supervision	
	Low cumulative illicit financial outflows	
	FATF and Regional Body Membership	
	FATF Compliance Score	
	Public Registry of Company Beneficial Ownership	
	Member of the Egmont Group	
		
<i>Negative indicators (points are subtracted):</i>		
Presence of denied parties by the US Department of the Treasury	2018 State Department List of countries posing money laundering/financial crime concern	
	Worldwide Biggest Black Markets ranking	
	Significant illicit financial outflows	
	Lack of influence of corruption	
		
<i>Extra credit (points are added or subtracted):</i>		
FATF R. 7 (2012): Compliant or largely compliant (points added), not compliant (points subtracted) FATF Immediate Outcome 11 (IO 11): Substantial or high effectiveness (added), low (subtracted) FATF Immediate Outcome 1 (IO 1): Substantial or high effectiveness (added), low (subtracted)		
		
<i>Expert judgment (points are added or subtracted on a case-by-case basis)</i>		

Table 5.1. Impact and point adjustment for Super Criterion
Ability to Prevent Proliferation Financing.

NOTES

1. FATF Recommendations 2 and 7.
2. Project staff considered an additional sub-criterion but were unable to find enough information, so it was not included in scoring: 1) Extent of training and knowledge of financial officials: Ideally, the PPI would measure whether a country has access to and participates in training and outreach programs relating to proliferation finance. However, information on this topic proved difficult to find. There does not seem to be much international assistance offered to countries wanting to improve proliferation financing prevention. Bilateral trainings to prevent financial crimes in general are conducted by the United States Federal Reserve System, Department of Homeland Security, Department of Justice, Federal Bureau of Investigation, Department of State, and Department of Treasury. The U.S. State Department has organized regional conferences and specific outreach events for countering financing of proliferation training, such as in South Korea and Qatar (2013) and Vienna (2015). The Asia-Pacific Group has also held workshops for members.
3. The 2019 PPI removed one indicator, “Lack of denied parties by United States and the European Union,” due to the sub-criterion’s use in Super Criterion *Adequacy of Enforcement*. This edition of the PPI added two new positive sub-criteria: “Public Registry of Company Beneficial Ownership,” and “Member of the Egmont Group.” One negative sub-criterion was changed from “Presence of denied parties by the United States and European Union,” to just “Presence of denied parties by the United States,” reflecting a decision to only penalize countries on the OFAC list. An extra credit opportunity was added in the form of “FATF Immediate Outcome 1 (IO 1): Ability of a country to assess and address its risk of money laundering (ML) and terrorist financing (TF).”
4. These 63 countries are: Andorra, Armenia, Australia, Austria, Bahamas, Bangladesh, Barbados, Belgium, Bhutan, Botswana, Cambodia, Canada, Colombia, Cook Islands, Cuba, Czech Republic, Denmark, Dominican Republic, Ethiopia, Fiji, Guatemala, Honduras, Hungary, Iceland, Indonesia, Ireland, Israel, Italy, Jamaica, Kyrgyzstan, Latvia, Madagascar, Malaysia, Mauritius, Mexico, Mongolia, Myanmar, Nicaragua, Norway, Palau, Panama, Portugal, Samoa, Saudi Arabia, Serbia, Seychelles, Singapore, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Tajikistan, Thailand, Trinidad and Tobago, Tunisia, Uganda, Ukraine, UK, US, Vanuatu, and Zimbabwe.
5. For the full text of recommendations see: FATF, *International Standards on Combating Money Laundering and the Financing of Terrorism and Proliferation-The FATF Recommendations*, Paris, France, published February 2012, updated October 2016, http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF_Recommendations.pdf
6. This formulation reflects the fact that Recommendation 2 in 2012 standards is the equivalent of Recommendation 31 in 2003 standards.

7. Points were assigned inversely proportional to the ranking, where the country with the worst ranking received the most points (10 points).
8. Jonathan Brewer, *Study of Typologies of Financing of WMD Proliferation, Interim Report* (London: Project Alpha, King's College London, February 5, 2017), <http://projectalpha.eu/wp-content/uploads/sites/21/2017/02/Study-of-Typologies-of-Financing-of-Proliferation-Interim-Report-5-Feb-2017.pdf>
9. Global Financial Integrity, *Illicit Financial Outflows from Developing Countries, 2004-2013*, May 1, 2017, <http://www.gfiintegrity.org/report/illicit-financial-flows-to-and-from-developing-countries-2005-2014/>. A different data set is used for the 2019 PPI. Instead of only using average Hot Money Narrow Outflows, the average Illicit Financial Outflows from Developing Countries in total are used. This includes “deliberate trade misinvoicing (gross excluding reversals or GER) and leakages in the balance of payments (hot money narrow or HMN).”
10. FATF, *Countries*, 2017, <http://www.fatf-gafi.org/countries/>
11. Tax Justice Network, “Financial Secrecy Index–Country Reports,” 2018, <https://www.financialsecrecyindex.com/PDF/17-Anti-Money-Laundering.pdf>
12. Tax Justice Network, “Secrecy Indicators,” <https://www.financialsecrecyindex.com/methodology/secrecy-indicators>
13. Individual internet research. The following sources were helpful: “Beneficial Ownership, Pledge Tracker,” <https://www.anticorruptionpledgetracker.com/issue-area/beneficial-ownership?scroll=400#info>; “Ultimate Beneficial Ownership – ACAMS Today,” <https://www.acamstoday.org/ultimate-beneficial-ownership/>; Library of Congress, “Disclosure of Beneficial Ownership in Selected Countries,” July 2017, <https://www.loc.gov/law/help/beneficial-ownership/disclosure-beneficial-ownership.pdf>; “Commitments on Beneficial Ownership Transparency at Anti-Corruption Summit,” GOV.UK, May 12, 2016, <https://www.wiltonpark.org.uk/wp-content/uploads/WP1502-Comments-on-beneficial-ownership-transparency-and-open-contracting-and-public-procurement-at-Anti-Corruption-Summit.pdf>
14. Egmont Group, “List of Members,” <https://egmontgroup.org/en/membership/lis>
15. For more details and an interpretable graph, see: David Albright, Sarah Burkhard, Allison Lach, and Andrea Stricker, *The Peddling Peril Index for 2017* (Washington, D.C.: Institute for Science and International Security, 2018), pp. 48-49.
16. See Organisation for Economic Co-operation and Development, Annex 2. A1, “A Note on FATF Data,” in *Illicit Financial Flows from Developing Countries: Measuring OECD Responses*, 2014, https://www.oecd.org/corruption/Illicit_Financial_Flows_from_Developing_Countries.pdf
17. U.S. Department of the Treasury, Office of Foreign Assets Control, “SDN List by Country,” <https://www.treasury.gov/ofac/downloads/ctrylst.txt>

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18. U.S. Department of the Treasury, Office of Foreign Assets Control, “Sanctions Programs and Information,” <https://www.treasury.gov/resource-center/sanctions/Pages/default.aspx>
19. U.S. Department of State, “International Narcotics Control Strategy Report– Money Laundering and Financial Crimes,” Bureau for International Narcotics and Law Enforcement Affairs, Volume 2, March 2018, <https://www.state.gov/documents/organization/278760.pdf>
20. Havocscope Global Black Market Information, “Havocscope Country Risk Ranking,” <http://www.havocscope.com/country-profile/> (Accessed January 2019).
21. Global Financial Integrity, “Illicit Financial Outflows from Developing Countries, 2005–2014,” Appendix Table I-3; “Estimated Ranges for Illicit Financial Flows, 2005–2014,” May 1, 2017, http://www.gfinintegrity.org/wp-content/uploads/2017/05/GFI-IFF-Report-2017_final.pdf
22. Transparency International, *Corruption Perceptions Index 2017*, February 21, 2018, https://www.transparency.org/news/feature/corruption_perceptions_index_2017. PPI entities for which a CPI rank was not available: Andorra, Antigua and Barbuda, Belize, Cook Islands, Fiji, Holy See, Kiribati, Liechtenstein, Marshall Islands, Micronesia, Monaco, Nauru, Niue, Palau, Palestine, Saint Kitts and Nevis, Samoa, San Marino, Tonga, Tuvalu, and Vanuatu.
23. FATF, *International Standards on Combating Money Laundering and the Financing of Terrorism and Proliferation–The FATF Recommendations*, Paris, France, published February 2012, updated October 2018, <http://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF%20Recommendations%202012.pdf>
24. FATF, “An effective system to combat money laundering and terrorist financing,” <http://www.fatf-gafi.org/publications/mutualevaluations/documents/effectiveness.html> (Accessed January 2019).
25. FATF Mutual Evaluations, <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology%202013.pdf>

CHAPTER 6

SUPER CRITERION ADEQUACY OF ENFORCEMENT

Super Criterion Adequacy of Enforcement assesses the adequacy of a state's enforcement activities or efforts against strategic commodity trafficking and the control of strategic trade. It assesses a range of 24 positive sub-criteria, including the national legal basis to act to penalize strategic commodity trafficking. The *Enforcement* super criterion assesses participation or lack thereof in applicable treaties, cooperation with countries that are strong on enforcement, and participation in foreign trainings and outreach. It also factors in issues that could inhibit enforcement. Of the 24 positive sub-criteria, nine are considered low-impact, eleven are medium-impact, and four are high-impact. They are worth 5, 10, and 15 points, respectively. One negative indicator was added where a country could lose five points. Finally, to clearly highlight effectiveness rather than theoretical capabilities, expert judgment was applied. If there was a significant number of concrete examples or a prevalence of expert opinions about government malfeasance or willful negligence in sound enforcement practices, country scores were adjusted. A country could receive up to 215 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

SUB-CRITERIA¹:

- Existence of legal basis or entity ensuring enforcement of the laws on transit of nuclear weapons and related materials²

Data for this sub-criterion comes from matrices developed by the oversight committee of UN Security Council Resolution 1540. The Committee provides information on the status of a country's implementation of this sub-criterion. Specifically, relevant data are from individual 1540 country matrices, namely Table OP 3 (c) and (d).³ Just over half of all countries have reported to the Committee on this matter. Roughly 80 countries' reported enforcement mechanisms have been confirmed by the Committee.⁴ This sub-criterion is judged as high-impact.

- Existence of legal basis or entity ensuring transshipment law enforcement

As above, these data are from the 1540 status of implementation matrix, namely Table OP 3 (c) and (d).⁵ About 15 fewer countries have reported to the Committee in this sub-criterion than the above one, despite many countries referencing the same piece of legislation in both sub-criteria. Roughly half of all countries have reported some data to the Committee for this sub-criterion, and roughly 70 countries' reported enforcement mechanisms have been confirmed by the Committee. In some cases, PPI research revealed that other countries met this sub-criterion but had not reported that fact to the Committee. This sub-criterion is judged as high-impact.

- Participant in international legal assistance mechanisms

Countries that take advantage of existing international legal assistance mechanisms were awarded points. This is a high-impact indicator, as certain international assistance agreements are considered especially effective by the PPI.

The international legal assistance mechanisms considered are:

1. Customs Mutual Assistance Agreements, a bilateral agreement with the United States;⁶
2. Nairobi Convention, a WCO legally binding convention on customs assistance;⁷

3. Program of measures, EU countries only. The full name of the program is Programme of Measures to Implement the Principle of Mutual Recognition of Decisions in Criminal Matters. It supports judicial cooperation within the European Union, facilitating investigations and prosecutions;⁸
4. Inter-American Convention on Mutual Assistance in Criminal Matters. States agree to “render to one another mutual assistance in investigations, prosecutions, and proceedings that pertain to crimes;”⁹
5. ASEAN Treaty on Mutual Assistance in Criminal Matters, which is similar to the Inter-American Convention above;¹⁰ and
6. **New:** Mutual Legal Assistance (MLA) agreements with the United Kingdom.¹¹

- **Ability to conduct investigations**

The World Justice Project scores countries’ ability to conduct investigations, a critical process for successful enforcement of national and international law. The results are part of the annual publication of the Rule of Law Index for 2017-2018. The score is extracted from each country’s profile and can be found under Criminal Justice, indicator 8.1, “Effective investigations.”¹² It is considered a high-impact sub-criterion.

- **Has own sanctions list**¹³

This sub-criterion refers to a country having established its own nationally-binding list of sanctioned persons, entities, and groups that are denied exports. EU countries without their own national list received half points for establishing the EU denied parties list, since it is difficult to determine which countries contribute most to administering and maintaining that list. Countries that enshrined the UN sanctions list into their national legislation, such as Malaysia, also received points. This sub-criterion is judged as having medium impact.

- **Party to the Arms Trade Treaty and brokering controls**¹⁴

The Arms Trade Treaty acts to control international trade in conventional weapons. Unlike most treaties, it has brokering controls. It requires parties of the treaty to establish stringent systems to control and monitor the “export, import, transit, trans-shipment and brokering” of conventional

arms, which, if implemented, would have an overarching positive effect on a country's general trade control. Although not specifically related to brokering for all strategic items, these controls indirectly indicate the ability of a country to control brokering. Countries with an implementation record of the brokering provisions under the ATT received full points. Countries that ratified the ATT but have no public implementation record received half points. The impact of this sub-criterion is medium.

- **Participates in foreign training and outreach on improving trade control efforts¹⁵**

Combating illicit trade is an international effort. Many countries that have been identified as lacking sufficient trade controls reach out to the international community for training and assistance with the goal of improving their practices. Different forms of training and outreach exist, many of which are facilitated by the 1540 Committee. Trainings range from hour-long online courses to week-long on-site drills and exercises. Since there is not necessarily a direct correlation of the amount of training received and enforcement effectiveness, points were only awarded for completion of specific sets of training programs. Points were awarded if a country participated in one or more key training programs that were deemed as the most effective and applicable to this sub-criterion. This sub-criterion had a medium impact in scoring.

- **Lack of influence of corruption**

Corruption can interfere significantly in the implementation of trade controls and their enforcement. Companies engaged in exporting may think they can simply ignore any legal export requirements if they believe there is little likelihood of being investigated or prosecuted. Corruption would likely inhibit strong enforcement, just as it does in countering the financing of proliferation, which is why this indicator is also used in Super Criterion *Ability to Prevent Proliferation Financing*. This sub-criterion uses the 2017 Corruption Perceptions Index, or CPI, by Transparency International.¹⁶ This index was selected from a variety of corruption measures and indices, mainly because this index lists the most countries and is widely respected. The PPI used the rank of a country in the CPI to assign points, rather than the score derived by Transparency International. The points in this sub-criterion were assigned in an inversely proportional

way to their relative rank. If the country or entity did not appear on the CPI, it was not assigned points. This sub-criterion has a medium impact.

- **Member of Interpol¹⁷**

Cross-border investigations are crucial to preventing, detecting, and dismantling commodity trafficking and activities of their procurement networks. Interpol aims to “facilitate international police cooperation even where diplomatic relations do not exist between particular countries.” As such, being a member of Interpol is an indicator of a willingness and openness to prevent transnational crime such as import and export violations. As of the summer of 2018, 190 PPI entities had Interpol membership. It is a medium-impact sub-criterion.

- **Legal authority in place to conduct undercover investigations¹⁸**

The legal authority to conduct undercover operations to sting those involved in illicit exports or to stop trade control violations is important to enforcement efforts. This type of explicit legal authority to conduct undercover operations was found for only a fraction of countries (31). Authoritarian countries may also be able to conduct undercover operations under broad security laws, but only countries with explicit legal authorities were awarded points under this sub-criterion. This is a medium-impact indicator.

- **Lack of parties on select United States and European Union screening lists¹⁹**

Many countries have individuals or companies listed on one of the following screening and sanctions lists: U.S. Commerce Department Bureau of Industry and Security (BIS) Entity List, State Department Bureau of International Security and Nonproliferation (ISN) Nonproliferation Sanctions list, or the EU Restrictive Measures list. A country was awarded points under this sub-criterion if it does not appear on any of the three lists. When assigning points for this criterion, the number of entities was not taken into consideration, and points were only awarded if a country does not have a single entity on any of those sanctions or screening lists. Most countries have either no sanctioned or flagged entities, or they have many. For example, China has 21 entities on the ISN Nonproliferation sanctions list alone, followed by Russia with 16. The BIS Entity List was selected, rather than the BIS Denied Persons List, because the former has entities

sorted by country instead of by name. This sub-criterion is measured as medium-impact.

- **New: National law requires or incentivizes Internal Compliance Programs (ICPs) for companies²⁰**

An ICP is a set of procedures that ensures a firm to adhere to national export control laws. Establishing and maintaining an ICP requires company resources, but it is incentivized by many governments with the promise of privileges, such as fast-tracked approval for global export authorization, and bulk licensing. Few countries require ICPs, but many incentivize it. This is a medium-impact sub-criterion.

- **New: Dual-use export control list is readily accessible²¹**

This sub-criterion was only applied to countries known to have a dual-use export control list, i.e. PPI countries that fall under the dark green category for export control legislation. A control list that is available online is useful in easily determining what, if any, license is required to export a good. It also helps governments hold suppliers accountable since licensing requirements are easily accessible. The link to the control list should be easily found on at least one government website, not only on a third-party website, such as a consulting group. Full points were awarded if a PPI staff member was able to find the control list in roughly ten minutes or less. This sub-criterion is judged as medium-impact.

- **Contracting party to the Revised Kyoto Convention and acceptance of customs controls in Free Trade Zones²²**

Chapter 2 of Specific Annex D to the Revised Kyoto Convention addresses FTZs and calls for streamlined controls. Specifically, recommendation 4 states that “customs shall have the right to carry out checks at any time on the goods stored in a free zone.”²³ 93 countries are contracting parties, but only 21 have accepted Annex D2, Recommendation 4. Full points were assigned if a country is a contracting party to the convention and accepts Specific Annex D, Chapter 2, Recommendation 4. Half points were assigned if a country is only a contracting party. This is a medium-impact sub-criterion.

- Has border seizure authority²⁴

Using information already collected under Super Criterion *Legislation*, this authority entails legal permission to investigate goods crossing borders. In most cases, it implies the legal authority to search and seize goods if necessary. However, authorities vary depending on the point of entry (land border, airport, or sea port). Due to the lack of clear information on specific legal authorities and responsibilities across points of entry, the extent of the specific authority can only be inferred and not stated with certainty. Therefore, for 2019, the impact was reduced from high to low.

- Enacts criminal penalties for illegal transportation of nuclear weapons by non-state actors²⁵

These data are from the 1540 status of implementation matrices for individual countries, in this case from Table OP 2. The PPI awarded points for having in place legislation enacting criminal penalties, because making the transport of a readily-deployable nuclear weapon a crime is part of the bare minimum that any country can do to prevent the proliferation of nuclear weapons. A total of 111 countries or entities were individually confirmed by the PPI to have this legislation. It is assigned a low impact.²⁶

- Enacts criminal penalties for illegal transfer of nuclear weapons by non-state actors²⁷

These data are from the 1540 status of implementation matrices for individual countries, and as above, from Table OP 2. The PPI awarded points for having legislation in place enacting criminal penalties, because making the transfer of a readily deployable nuclear weapon a crime is also part of a minimum that any country can do to prevent the proliferation of nuclear weapons. A total of 122 countries or entities were confirmed to have this legislation. It is assigned a low impact.²⁸

- Has an extradition treaty with the United States or United Kingdom²⁹

Extradition treaties with the United States and United Kingdom, strong trade control enforcement states, are a good indicator of willingness to subject citizens to and participate in the rule of law. The signatory country must surrender U.S. or UK nationals, in this case, for trade control violations, and the United States or UK can ask for the extradition of foreign

nationals, who are suspected of violating or have violated trade control laws, to be investigated and prosecuted. This serves not only as deterrent to foreign nationals who would violate U.S. and UK trade control laws, but also as deterrent for proliferators against setting up illegal procurement channels in the signatory country. Many countries, especially small or developing countries, have signed and ratified U.S. or UK extradition treaties. Nevertheless, this sub-criterion is judged as low-impact. First, this sub-criterion is limited only to extradition treaties with the United States and UK. Second, there must be “dual criminality” for the treaty to be honored. The violation for which a person can be extradited must also be a violation in the signatory country. Some countries, such as Georgia, have not signed a U.S. extradition treaty but are known to extradite upon request.

- **A low number of documents is required for exports³⁰**

A low number of documents needed for export is a suggestive, yet indefinite indicator for efficient, transparent, and streamlined export control systems. This sub-criterion used the World Bank’s “Ease of Doing Business” database. The number of documents needed in each country to export goods was taken as an average from World Bank research from 2005 to 2014. Of note, there appears to be a trend that corrupt countries, as identified by Transparency International’s CPI, require a high number of documents, suggesting that, to some extent, corruption makes exporting less streamlined. This sub-criterion is judged as low-impact.³¹

- **Utilizes voluntary tax disclosure procedures, as an indicator of voluntary WMD/dual-use proliferation disclosure procedures³²**

The PPI ideally sought to identify whether each country has a procedure for companies to voluntarily disclose to the government that an inadvertent or deliberate export of controlled or sensitive strategic goods occurred.³³ However, no such information could be systematically found. As a result, another indicator, voluntary tax disclosure procedures, or self-disclosures of issues with tax filings, was identified as indirectly measuring the potential use or existence of voluntary disclosures for commodities. The assumption is that a country employing tax disclosure procedures increases the likelihood of there being a self-disclosure procedure involving commodities. Because of the assumption in deriving points in this sub-criterion, it is assigned a low impact.

- **New: Member of the Harmonized System (HS)³⁴**

The harmonized system is a multipurpose international product nomenclature developed by the World Customs Organization. The system is used by participants as a tool for international trade and customs. Use of the system is an indirect measure for interagency cooperation and coordination. However, the HS product classification codes are very broad, and they need further development, especially in the strategic commodity category. Therefore, it is a low-impact sub-criterion.

- **New: Existence of national regulatory authority to account for nuclear weapons/related material production³⁵**

A national regulatory authority accounts for, secures, and protects nuclear weapons and related materials.³⁶ Countries with legislation in place that requires such an authority help ensure the non-proliferation and safeguarding of nuclear weapons and related materials. This information is taken from the Resolution 1540 matrices. It is a low-impact sub-criterion.

- **New: Existence of Nuclear Industry Association³⁷**

This indicator assesses whether an industry association specifically for suppliers of nuclear-related goods and technologies exists in the country. For example, FORATOM is an umbrella nuclear association for European countries, with a membership of fifteen national nuclear associations. These associations serve as platforms for workshops, awareness building, and information exchange, including on non-proliferation. FORATOM lists non-proliferation as one of the key topics it deals with (among others, such as energy supply and nuclear safety)³⁸ Currently, only the member countries of FORATOM receive points; however, the PPI is willing to assign points to other countries that come forward and show that they have a nuclear industry association that takes an active role in non-proliferation. This is a medium-impact indicator.

- **New: Submitted sanctions implementation report on North Korea³⁹**

UN Security Council Resolution 1718 (2006) is a key resolution in a series of resolutions imposing sanctions on the DPRK. The sanctions prohibit UN member states from engaging in direct or indirect supply, sale, or transfer of certain goods to the DPRK, including “items, materials,

equipment, goods and technology [...] which could contribute to DPRK’s nuclear-related, ballistic missile-related or other weapons of mass destruction-related programmes.”⁴⁰ By now, most member countries have submitted at least one report on their implementation of the sanctions.⁴¹ Therefore, this is a low-impact sub-criterion.

NEGATIVE INDICATORS:

- Government interference with sound enforcement practices**

Points were deducted for 44 countries based on several measures, including expert judgment and direct knowledge of a country’s efforts to hinder enforcement, history of large-scale illicit procurements by state entities, and multiple, significant cases of illicit exports ignored by the state or known to be missed by the state. To help arrive at a conclusion about which states to include in this negative indicator, the project used a survey of about ten experts with specific knowledge of commodity trafficking in a wide range of countries. Seven failed states were also included in the survey.

- New: Percentage of firms expected to submit bribes to obtain an import license⁴²**

Providing a bribe to acquire an import license is associated with the activities of front or shell companies in illicitly importing controlled goods. This indicator, based on World Bank data, measures the percentage of total firms estimated to provide “gifts” to import goods and points to systemic corruption within a country, and specifically among trade control officials. In some countries, 20 percent or more of firms are expected to provide official bribes to obtain an import license. In 53 PPI entities, more than ten percent of firms are expected to provide gifts or bribes for imports. These entities lose five points. This is a low-impact, negative sub-criterion.

- Expert Judgment**

Based on expert judgment, about two dozen countries that have been sanctioned by the United States and European Union also had points subtracted. These subtractions affected countries the most with known strategic trade control issues, such as Belarus, China, Hong Kong, and

Russia. They also affected a range of countries in Tier Two and a few countries in Tier Three. In about half of the cases, subtractions were relatively small (less than ten points in the final PPI score).

In the future, the PPI is considering deducting points for countries that repeatedly participate in UN sanctions evasion schemes or otherwise willfully or neglectfully enable sanctioned entities to conduct illicit business. These data would primarily come from Panel of Experts reports to the UNSC Resolution 1718 (2006) Sanctions Committee on North

CONSIDERED SUB-CRITERIA

The project considered additional sub-criteria but was unable to find enough information, so these sub-criteria were not included in scoring:

1. A customs or domestic intelligence unit exists which devotes resources and expertise to knowing their countries' supply potential and understanding the strategic commodity trafficking networks and agents targeting the industry. Ideally, the intelligence unit also conducts industry outreach and serves as a point of contact for industry members to report suspicious inquiries or orders.
2. Licensing agency has authority within Free Trade Zones (FTZs). No data were collected for this indicator because a general lack of transparency, conformity, and regulations exist within FTZs and similar economic zones. To successfully prevent commodity trafficking, many countries need to drastically improve controls and regulations inside FTZs. For the same reason, another sub-criterion, "A designated authority to inspect and detain goods exists in FTZs," was considered but not used.
3. Has produced successful trade control prosecutions. Successful prosecutions as an indicator of sound enforcement of trade control systems were only considered on a case-by-case basis due to the difficulty of finding information for all countries. Only a few countries have specialized prosecution units for export control-specific violations, such as Germany, Sweden, or the United States. Some countries, such as Japan, are known to have a high rate of successful prosecutions, while other countries, such as Malaysia, have a lower rate.
4. Has "technical reachback capacity," or access to expert knowledge on trade control enforcement. This sub-criterion attempted to measure the ability of trade control officials and companies to obtain technical information from the government or contractors about the potential misuse of goods. Not enough information could be found to assign points.

5. Country is known to act upon information from foreign intelligence sharing. This sub-criterion refers specifically to addressing trade control cases. As it is difficult to determine the extent to which countries act upon foreign information for the clear majority of countries, no points were assigned for the PPI ranking. Nevertheless, it is an important aspect of combating strategic commodity trafficking. For some countries, such as South Korea, Germany, Britain, and Israel, cases of successful intelligence sharing and subsequent actions to thwart illegal activities are publicly known. In general, all Proliferation Security Initiative and North Atlantic Treaty Organization (NATO) members officially share intelligence among the members of these arrangements, nevertheless, the extent to which this is done in practice is unknown.
6. A country has sufficient criminal or civil penalties to deter trade control violations. It is especially important to have criminal penalties in cases where the violation is willful and of a significant nature with respect to non-proliferation. Criminal or civil penalties for trade control violations can serve as an effective deterrent for potential proliferators. Finding, comparing, and quantifying penal codes for all 200 countries was infeasible. Additionally, since not all countries have strategic trade control systems in place, many countries' penal codes for trade control violations would not apply to strategic goods. Instead, the PPI looked for the countries with a trade control system in place, e.g. green legislation, where trade control violations can lead to incarceration of convicted individuals. Prison sentences following export control violations were found for approximately a quarter of all countries. Some countries with otherwise strong trade controls showed a trend of enacting relatively short prison sentences, often less than five years, or even less than one year, for export control violations. This trend in sentencing was strikingly apparent in Europe.
7. Uses information technology (IT) data system for licensing procedures. Ideally, when export license requests are submitted or granted, all information should be collected electronically. This not only helps investigators, but also allows for risk-based decision-making by licensing officials. The PPI was unable to collect sufficient data on which countries collect licensing data electronically and which do not, therefore, no points were assigned.
8. Agency exists that investigates trade control violations. The existence of such an authority was considered on a case-by-case basis. Only a few countries have a specialized criminal investigation unit for trade control violations. In most countries, investigations are conducted by police or customs.

Korea. For example, in an Institute analysis of the March 2019 Panel of Expert report, several countries were found to be involved in unusually large numbers of sanctions violations during 2018. A deduction would be based on evaluating the two or three most recent Panel of Experts reports.

IMPACT OF SUB-CRITERIA:

The PPI assigned a high to low impact for weighting each of the sub-criteria. **Table 6.1** shows how each indicator was weighted in the evaluation and how much of an impact it therefore had on a country's score within the super criteria.

SCORING

Of the 24 positive sub-criteria, nine are considered low-impact, eleven are medium-impact, and four are high-impact. They are worth 5, 10, and 15 points, respectively. There are two additional, negative indicators, and a final round of expert judgment where points were subtracted on a country-by-country basis if deemed necessary. A country could receive up to a total of 215 points under this super criterion. This raw score is used later to arrive at a total, weighted score and rank for each country. It is also used to derive a ranking for the country under the three tiers.

CHAPTER 6

HIGH-IMPACT (4)	
Legal basis or entity ensuring transit enforcement of nuclear weapons, material	
Legal basis or entity ensuring transshipment enforcement	
International legal assistance mechanisms	
Ability to conduct investigations	
MEDIUM-IMPACT (11)	
Has own sanctions list	
Party to the Arms Trade Treaty and brokering controls	
Participates in foreign training and outreach	
Lack of influence of corruption	
Interpol member	
Legal authority to conduct undercover investigations	
Lack of denied or flagged parties by the U.S. and EU	
Requires or incentivizes ICPs	
Control list readily accessible	
Revised Kyoto Convention and customs checks in FTZs	
Existence of Nuclear Industry Association	
LOW-IMPACT (9)	
Criminal penalties for illegal transport of nuclear weapons	
Criminal penalties for illegal transfer of nuclear weapons	
Has extradition treaty with the U.S. or UK	
Low number of documents needed for export	
Uses voluntary tax disclosure procedures	
Member of Harmonized System	
National Regulatory Authority for nuclear weapons/material production	
Border seizure authority	
Sanctions report on North Korea	
Negative indicators:	
Government interference and malfeasance in enforcement; Expected to submit bribes to obtain an import license	
Expert Judgment	

NOTES

1. For the 2019 PPI, the sub-criterion “Existence of a denied parties list” was changed to “Has own sanctions list” in order to better assess application of sanctions. The 2017 PPI awarded points to all countries that were UN member states and therefore subject to applying UN sanctions. The sub-criterion “Has an extradition treaty with the United States” was changed to include “United States or United Kingdom.” The indicator, “Lack of denied parties by the United States” was changed to include “United States and European Union.” The sub-criterion, “National trade control legislation includes a catch-all clause” was removed from *Enforcement* since it is used in the *Legislation* Super Criterion. The 2019 PPI discontinued the use of the sub-criterion, “Legal commitment to enforce UN sanctions” since it awarded points to all UN member states for being subject to enforcing UN sanctions, regardless of their record on sanctions enforcement. A new indicator, “Submitted sanctions implementation report on North Korea,” is used to attempt to better assess sanctions implementation in practice.
2. The UN 1540 Committee defines “related materials” in the matrices as: “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.”
3. For example, see the 1540 Committee Matrix of Afghanistan, row 20, <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. In row 20 of a specific country’s matrix, a “X” in the “Enforcement: civil/criminal penalties, and measures of implementation, etc” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. A question mark was given partial credit. An empty cell received no points.
4. 1540 Committee Approved Matrices, Dated December 23, 2015, <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>
5. Ibid. In row 21, a “X” in the “Enforcement: civil/criminal penalties, and measures of implementation, etc” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. A question mark was given partial credit. An empty cell received no points.
6. <https://www.cbp.gov/border-security/international-initiatives/international-agreements/cmaa>
7. <http://www.wcoomd.org/~media/wco/public/global/pdf/about-us/legal-instruments/conventions-and-agreements/nairobi/eg0019e1.pdf?la=en>
8. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001Y0115%2802%29>
9. <http://www.oas.org/juridico/english/treaties/a-55.html>
10. <http://agreement.asean.org/media/download/20160901074559.pdf>

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11. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516418/Treaty_List.pdf
12. World Justice Project, Rule of Law Index 2017-2018 Report, <https://worldjusticeproject.org/our-work/publications/rule-law-index-reports/wjp-rule-law-index-2017-2018-report>
13. Examples of denied parties lists: Government of Canada, “Consolidated Canadian Autonomous Sanctions List,” updated November 29, 2018, https://international.gc.ca/world-monde/international_relations-relations_internationales/sanctions/consolidated-consolide.aspx?lang=eng; European Commission, European Union – Restrictive Measures (Sanctions) In Force, updated April 26, 2017, https://eeas.europa.eu/sites/eeas/files/restrictive_measures-2016-10-11-clean.pdf
14. United Nations, *The Arms Trade Treaty*, in force since December 24, 2014, <https://unoda-web.s3.amazonaws.com/wp-content/uploads/2013/06/English7.pdf>; List of ATT Party Statuses, June 2016, <https://s3.amazonaws.com/unoda-web/wp-content/uploads/2018/06/ATT-status-table-WebReport-June-2018.pdf>
15. The trainings considered included:
 1. The Export Control and Related Border Security (EXBS) Program, assisting countries to “develop and improve their strategic trade and related border control systems,” <https://www.state.gov/t/isn/ecc/c27911.htm>;
 2. EU P2P (Partner-to-Partner) Dual-use Export Control Program, assisting countries to “enhance the effectiveness of export control systems of dual-use items,” <https://export-control.jrc.ec.europa.eu/Home/Dual-use-trade-control>;
 3. International Criminal Investigative Training Assistance Program (ICITAP), assisting countries to “to develop professional and transparent law enforcement institution,” <https://www.justice.gov/criminal-icitap>;
 4. WCO Columbus assistance program, a Customs Capacity Building initiative led by the WCO. The program has been integrated into the Mercator program, for which participants are not made public. Therefore, the use of this data may be discontinued in a future PPI version; and
 5. Defense Threat Reduction Agency International Counterproliferation Program (DTRA ICP), providing education and equipment to countries’ “police, border officials, investigators and national security executives,” <http://www.dtra.mil/Missions/Partnering/ICP.aspx>.
16. PPI entities for which a CPI rank was not available: Andorra, Antigua and Barbuda, Belize, Cook Islands, Fiji, Holy See, Kiribati, Liechtenstein, Marshall Islands, Micronesia, Monaco, Nauru, Niue, Palau, Palestine, Saint Kitts and Nevis, Samoa, San Marino, Tonga, Tuvalu, and Vanuatu.
17. Non-members include the Cook Islands, North Korea, Kiribati, Kosovo, Micronesia, Niue, Palau, Taiwan, Tuvalu, and Vanuatu. See: International Criminal Police Organization, “Overview – About Interpol,” 2017, <https://www.interpol.int/About-INTERPOL/Overview>

18. In the European Union, for example, entrapment is not allowed, but undercover operations are permitted. See: Philip Gounev et al., “Part 3: Legal and Investigative Tools,” Center on the Study of Democracy, https://ec.europa.eu/home-affairs/sites/homeaffairs/files/e-library/docs/20150312_1_amoc_report_020315_0_220_part_2_en.pdf
19. U.S. Department of Commerce, Bureau of Industry and Security, “Supplement No. 4 to Part 744–ENTITY LIST,” Export Administration Regulations, <https://www.bis.doc.gov/index.php/forms-documents/regulations-docs/federal-register-notices/federal-register-2014/957-744-supp-4-1/file>; U.S. Department of State, Bureau of International Security and Nonproliferation, “Nonproliferation Sanctions,” September 2018, <https://www.state.gov/documents/organization/284359.pdf>; European Commission, “European Union–Restrictive measures (sanctions) in force,” July 2016, https://eeas.europa.eu/sites/eeas/files/restrictive_measures-2017-04-26-clean.pdf
20. Individual internet searches; Source for European countries: Official Journal of the European Union, “Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items,” EUR-Lex, May 5, 2009, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32009R0428>
21. Individual internet searches.
22. World Customs Organization, “List of the Contracting Parties to the Revised Kyoto Convention,” September 2018, http://www.wcoomd.org/en/Topics/Facilitation/Instrument%20and%20Tools/Conventions/pf_revised_kyoto_conv/Instruments
23. World Customs Organization, “Specific Annex D,” Text of the Revised Kyoto Convention, April 17, 2008, http://www.wcoomd.org/en/topics/facilitation/instrument-and-tools/conventions/pf_revised_kyoto_conv/kyoto_new/spand.aspx
24. Internet research.
25. 1540 Committee Approved Matrices, Dated December 23, 2015, <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>. For example, 1540 Committee Matrix for Afghanistan, in row 6 of Table OP 2, <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. A “X” in the “National legal framework” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. For a question mark, legislation was individually confirmed to exist or not exist by PPI staff.
26. The 2017 PPI assigned this indicator a medium impact.
27. Ibid. For example, 1540 Committee Matrix for Afghanistan, in row 7 of Table OP 2, <http://www.un.org/en/sc/1540/documents/Afghanistan%20revised%20matrix.pdf>. A “X” in the “National legal framework” cell relating to NW (nuclear weapons) was taken as confirmation that sufficient enforcement mechanisms exist. For a question mark, legislation was individually confirmed to exist or not exist by PPI staff.

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28. The 2017 PPI assigned this indicator a medium impact.
29. Michael John Garcia and Charles Doyle, “Extradition to and from the United States: Overview of the Law and Recent Treaties” (Washington, D.C.: Congressional Research Service, March 17, 2010), see Appendix A: Countries with which the United States has a Bilateral Extradition Treaty, <https://fas.org/sgp/crs/misc/98-958.pdf>. Specifically, Chapter 209 “Extradition” of the U.S. Code, Title 18, “Crimes and Criminal Procedure,” Paragraph 3181, reads: “The provisions of this chapter shall be construed to permit, in the exercise of comity, the surrender of persons [...] who have committed crimes of violence against nationals of the United States in foreign countries [...].” See: <https://www.law.cornell.edu/uscode/text/18/3181>; For countries that have an extradition treaty with the UK: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516418/Treaty_List.pdf
30. The number of documents needed for exports is found in the World Bank “Ease of Doing Business” database on a country-by-country case basis. Access to the database is available here: http://data.worldbank.org/indicator/IC.EXP.DOCS?end=2014&name_desc=false&start=2013
31. Five points were awarded if only one document was required, and zero points were awarded if a country had the highest number of documents required in country list. The fraction of number of documents required out of the highest number of documents required was scaled out of five points.
32. OECD, “Update on Voluntary Disclosure Programmes: A pathway to tax compliance,” August 2015, <https://www.oecd.org/ctp/exchange-of-tax-information/Voluntary-Disclosure-Programmes-2015.pdf>; World Customs Organization, “Voluntary Disclosure,” Permanent Technical Committee 201st/202nd Sessions, Belgium, Brussels, November 4-8, 2013, <http://www.wcoomd.org/en/topics/facilitation/resources/permanent-technical-committee/~media/4C64301A393745989A29EAF535AE8D08.ashx>
33. In the United States, for export control violations, a voluntary self-disclosure process is administered by the Department of Commerce’s Bureau of Industry and Security. On its website, BIS provides an address and contact number and explains, “BIS encourages the submission of Voluntary Self Disclosures (VSDs) by parties who believe they may have violated the Export Administration Regulations (EAR).” In 2014, according to interviews conducted for a journal article on U.S. export control reform, BIS processed 225 VSDs. Typically, the majority of these cases result in settlements and civil penalties only, increasing the incentive for companies to make voluntary disclosures. See BIS, “Voluntary Self-Disclosure,” <https://www.bis.doc.gov/index.php/enforcement/oee/voluntary-self-disclosure>; James E. Bartlett III and Jonathan C. Poling, “Defending the ‘Higher Walls’ – The Effects of U.S. Export Control Reform on Export Enforcement,” *Santa Clara Journal of International Law*, Vol. 14, Issue 1, December 7, 2015, <http://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1196&context=scujil>

34. World Customs Organization, “List of 211 Countries, Territories or Customs or Economic Unions Applying the Harmonized System,” May 31, 2018, http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/overview/hs-contracting-parties/list-of-countries/countries_applying_hs.pdf?db=web
35. UN 1540 Committee, “Committee Approved Matrices,” <http://www.un.org/en/sc/1540/national-implementation/1540-matrices/committee-approved-matrices.shtml>, OP3 a and b, row 1.
36. The UN 1540 Committee defines “related materials” in the matrices as: “materials, equipment and technology covered by relevant multilateral treaties and arrangements, or included on national control lists, which could be used for the design, development, production or use of nuclear, chemical and biological weapons and their means of delivery.”
37. Foratom, “Membership,” <https://www.foratom.org/our-members/>
38. Foratom, “About Us,” <https://www.foratom.org/about-us/>
39. United Nations Security Council Subsidiary Organs, “Resolution 1718 Implementation Reports,” <https://www.un.org/securitycouncil/sanctions/1718/implementation-reports>
40. See: UN Security Council, *Security Council Resolution 1718 (2006)*, S/RES/1718, October 14, 2006, [https://www.undocs.org/S/RES/1718%20\(2006\)](https://www.undocs.org/S/RES/1718%20(2006))
41. A potential change in a future PPI could be to assign points only to countries that submitted an implementation report by the most recent deadline.
42. World Bank, “Enterprise Surveys–Corruption,” <http://www.enterprisesurveys.org/data/exploretopics/corruption#—7>

CHAPTER 7

TOTAL WEIGHTED SCORE AND RANK

A methodological question for the PPI was how to combine the raw super criteria scores to derive final country scores, and subsequently the final PPI rank. We considered using simple addition of the raw super criteria scores (or scaling them, for example, where each super criterion score is scaled to 100 points and then added with the other super criteria scores) to achieve a total score. However, such an approach would imply that each super criterion is equal in value or weight. Moreover, the project found that the *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria are two of the most important due to their action-oriented or implementation-based nature; the *International Commitment* or *Legislation* super criteria are of reduced importance because the PPI measures the *implementation* of strategic trade controls. The PPI is different than other indices by focusing on tangible outcomes versus strictly capacities or legislative capabilities, although these are certainly important. Nonetheless, simply adding the raw super criteria scores, or even scaling each to 100 points and adding, would undermine the intent of the index.

WEIGHTING ARRANGEMENT

The project considered several weighting options for the super criteria. Based on discussions among experts, a favored weighting option emerged. The project decided to scale each super criterion score to 100

points and then apply a weighting factor. Under this methodology, the *Ability to Prevent Proliferation Financing* and *Adequacy of Enforcement* super criteria each received double the scaled points of the *Legislation* and *Ability to Monitor and Control Strategic Trade* super criteria, which in turn received double the scaled points of the *International Commitment* super criterion. For *International Commitment*, *Legislation*, *Ability to Monitor and Detect Strategic Trade*, *Ability to Prevent Proliferation Financing*, and *Adequacy of Enforcement*, the weighting factors are, after scaling each to 100 points, 1, 2, 2, 4, and 4, respectively. The conversion of the raw possible super criteria scores from the earlier sections into scaled, weighted scores is summarized in Table 7.1.

	Int'l Commitment	Legislation	Ability to Monitor & Detect Strategic Trade	Ability to Prevent Proliferation Financing	Adequacy of Enforcement	PPI Total (Points)
Raw Points Possible	250 Points	120 Points	185 Points	125 Points	215 Points	895
Scaled, Weighted Points Possible	100 Points	200 Points	200 Points	400 Points	400 Points	1300
Scaled, Weighted Percentage	7.7	15.4	15.4	30.8	30.8	100

Table 7.1. Raw points are scaled and weighted for each super criterion before they are added to derive the final PPI scores and rank. Each scaled, weighted percentage is rounded, as is the percentage total.

Super Criterion International Commitment: The points received under *International Commitment* count toward **7.7 percent** of the total score. As discussed earlier, the International Commitment super criterion incorporates 22 sub-criteria—three are considered low-impact, ten are medium-impact, and nine are high-impact, giving a total raw score of 250 points. This raw score was scaled to 100 and multiplied by its weight factor, in this case one, to contribute up to 100 points or 7.7 percent of the possible 1,300 points.

Super Criterion Legislation and Super Criterion Ability to Monitor and Detect Strategic Trade: 15.4 percent each

The *Legislation* super criterion incorporates 12 sub-criteria—four are considered low-impact, four are medium-impact, and four are high-impact, with a total raw score of 120 points. This score was scaled to 100 and multiplied by its weight factor of two to contribute up to 200 points or 15.4 percent of the possible 1,300 points.

The *Ability to Monitor and Detect Strategic Trade* super criterion incorporates 19 sub-criteria—five are considered low-impact, 10 are medium-impact, and four are high-impact, with a total raw score of 185 points. This score was scaled to 100 and multiplied by its weight factor of two to contribute up to 200 points or 15.4 percent of the possible 1,300 points.

Super Criterion Ability to Prevent Proliferation Financing and Super Criterion Adequacy of Enforcement: 30.8 percent each

The *Ability to Prevent Proliferation Financing* super criterion incorporates 12 sub-criteria—one is considered low-impact, nine are medium-impact, and two are high-impact, for a total raw score of 125 points. This score was scaled to 100 and multiplied by its weight factor of four to contribute up to 400 points or 30.8 percent of the possible 1,300 points.

The *Adequacy of Enforcement* super criterion incorporates 24 sub-criteria—nine are considered low-impact, eleven are medium-impact, and four are high-impact for a total raw score of 215 points. This score was scaled to 100 and multiplied by its weight factor of four to contribute up to 400 points or 30.8 percent of the possible 1,300 points.

TOTAL POINTS AND RANKINGS

The result of the weighting is a total point score and rank for each of the 200 countries, territories, and entities evaluated in the PPI. The scores varied widely, but no country received more than 80 percent of the total points (the highest score is 1,019 out of 1,300 points). Because points were deducted, scores below zero occurred. The lowest score is -205 points. Figure 7.1 shows a distribution of the scores. The median is 443 (down from 446 in 2017) points, and the average is 489 (up from 486 points

in 2017). The relatively low median suggests that, overall, countries did not score overly high. The average is somewhat greater than the median, suggesting that the global performance in implementation of trade controls remains bimodal. In Figure 7.1, one peak illustrates that about one quarter of countries have fairly robust strategic trade controls, e.g. comprehensive legislation and effective implementation, and the other shows that about three quarters of countries have far less effective systems.

2019 Total PPI Point Distribution

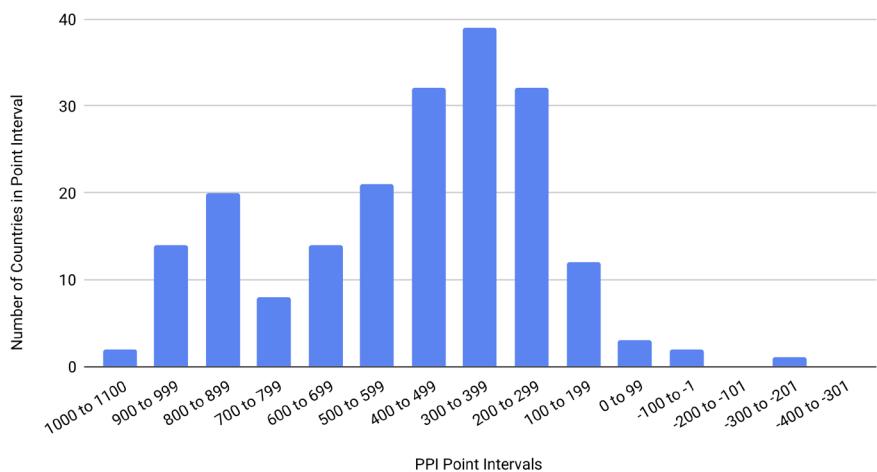


Figure 7.1. Distribution of total points in intervals of 100 points.

Annex 1 contains the full PPI ranking, with total points for each country. However, this long list is less useful to consider, because countries vary so widely on their need for strategic trade controls and the nature of their economies. The project opted to discuss the most important results in terms of tiers of similar countries (see next two sections). In addition, the reader should not assign too high of a precision to each ranking because of uncertainties in determining the scores (see below for further discussion of uncertainties).

Several countries are difficult to rank because of their dependency on other countries or their non-state status. Monaco relies on France's trade control system, and San Marino on Italy's. Kosovo is a disputed territory. Palestine is under the authority of Israel. The Holy See is difficult to rank as well because of its small size and lack of any industrial capability or

exports. Hong Kong is a special administrative region of China and many sub-criteria cannot be filled in. Taiwan's non-state status complicates developing a reliable rank for it. Overseas territories of countries, such as the British Virgin Islands and Aruba, were not evaluated or ranked individually, and in most cases, the trade control situation of an overseas territory was not considered in developing the rank of the state proper.

CLUSTER ANALYSIS

Despite emphasizing tiers, this edition of the PPI also includes a “cluster analysis” of the scores and ranks. This analysis is a multivariate method to classify a sample of subjects, in this case nations or territories, on the basis of a set of measured variables into a number of different clusters, such that similar subjects are placed in the same cluster. In essence, this statistical method groups scores around a set of relative peaks in the scores. This allows for a more effective look at the scores than the simple bimodal analysis conveyed in Figure 7.1.

The cluster analysis, created with the programming language Python, shows the 200 countries and entities evaluated in the PPI clustered into four groups (see Figure 7.2). The number of clusters was set to four after generating the probability density of the scores (Figure 7.3). The probability density graph visualizes the probabilities of a country to receive a certain score. Table 7.2 summarizes statistical details of the four clusters or groups.

Cluster 1 (Group 1) includes the ranks 1 to 41; Cluster 2 (Group 2) includes the ranks 42 to 96; Cluster 3 (Group 3) includes the ranks 97 to 168; and Cluster 4 (Group 4) includes the ranks 169 to 200. The corresponding score ranges are 1,019 to 749 for Cluster One, 718 to 458 for Cluster Two, 452 to 262 for Cluster Three, and 257 to negative 205 for Cluster Four. It is noticeable that Group 3 includes 72 countries, which is more than any of the other groups. Group 1 has 41 countries; Group 2 has 55 countries; and Group 4 has 32 countries. The countries in each cluster are listed in Annex 2.

In this case, the four clusters emerge around four relative centers in scores (*k*-means centroids), represented here as an ordered pair: Group 1: (rank 22, mean score 879); Group 2: (74, 542); Group 3: (140, 330); and Group 4: (188, 136). These centers appear to correlate with additional

relative peaks in the probability distribution function, and this analysis provides more insight into the structure of the data (Figure 7.3). The highest peak of the probability distribution function is in Group 3, which has the largest number of countries.

While the mean score of 879 for Cluster 1 lies above two-thirds of the available points (68 percent), the mean score for Cluster 2 falls short of half the available points (41 percent). The mean score as percentage of available points drops to just 25 percent for Cluster 3, and 10 percent for Cluster 4. Thus, while the gap between the mean of Clusters 2 and 3, and Clusters 3 and 4, is about equal (roughly 15 percent of available points), the gap between the mean of Clusters 1 and 2 represents 27 percent of the available points. As strategic trade controls gradually improve and PPI scores rise, we hope to see smaller low-scoring clusters and higher mean scores.

Table 7.2. Summarized details of the four clusters.

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Number of countries	41	55	72	32
Tier One countries	36	14	3	2
Tier Two countries	5	28	21	7
Tier Three countries		13	48	23
Rank range	1 to 41	42 to 96	97 to 168	169 to 200
Score range	1,019 to 749	718 to 458	452 to 262	257 to–205
k-means centroid (rank, mean score)	(22, 879)	(74, 542)	(140, 330)	(188, 136)

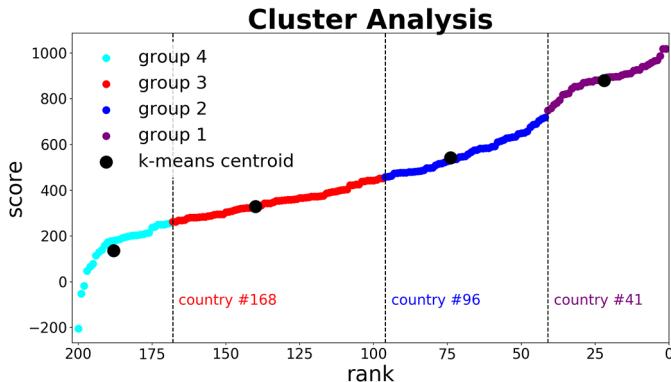


Figure 7.2. The 2019 PPI countries plotted by rank and score clustered into four groups.

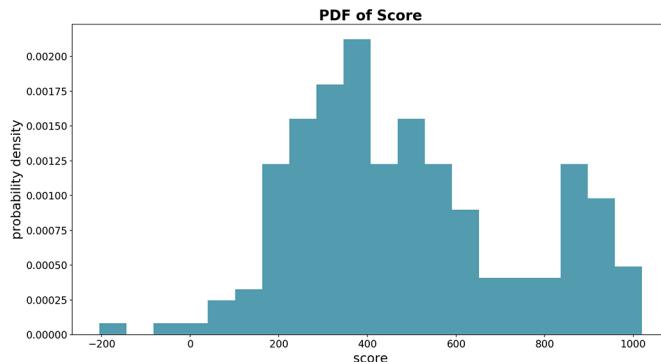


Figure 7.3. The probability distribution function (PDF) of the PPI 2019 scores.

PERFORMANCE FRACTIONS

Although a country's total score is the fundamental measure of the effectiveness of its strategic trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the "performance fraction" graph was developed in order to chart the extent to which countries have met the sub-criteria. For example, if the PPI assigned 0, 5, or 10 points for a country's adherence to the Additional Protocol (0 would entail no signature or ratification, 5 would signify signature but not ratification, and 10 would be for full ratification), the performance fraction would assess those base points awarded to each country before subtracting any

points from negative sub-criteria or deriving a weighted score. Performance fractions allow for a basic assessment of where points were not received and provide a straightforward roadmap for where countries can improve. In essence, performance fractions are calculated to locate omissions or deficiencies in a country's fulfillment of the PPI sub-criteria. Because of space limitations, we are not publishing individual country performance fractions in this report, but they are available upon request.

Figure 7.4 is an example that shows how Afghanistan either fulfilled, partly fulfilled, or did not fulfill the sub-criteria in the *International Commitment* super criterion. Afghanistan, for example, received all ten points for being a party to the NPT after 1970 (it would receive zero points otherwise). It therefore has a performance fraction of 1 in the NPT sub-criterion. With respect to the IAEA Safeguards Conclusion for 2015, by contrast, Afghanistan received only five points out of a possible 10 points, and therefore its performance fraction is 0.5, because it only received the IAEA's "conclusion" instead of the more ideal "broader conclusion."

Afghanistan: International Commitment Performance Fractions 2019

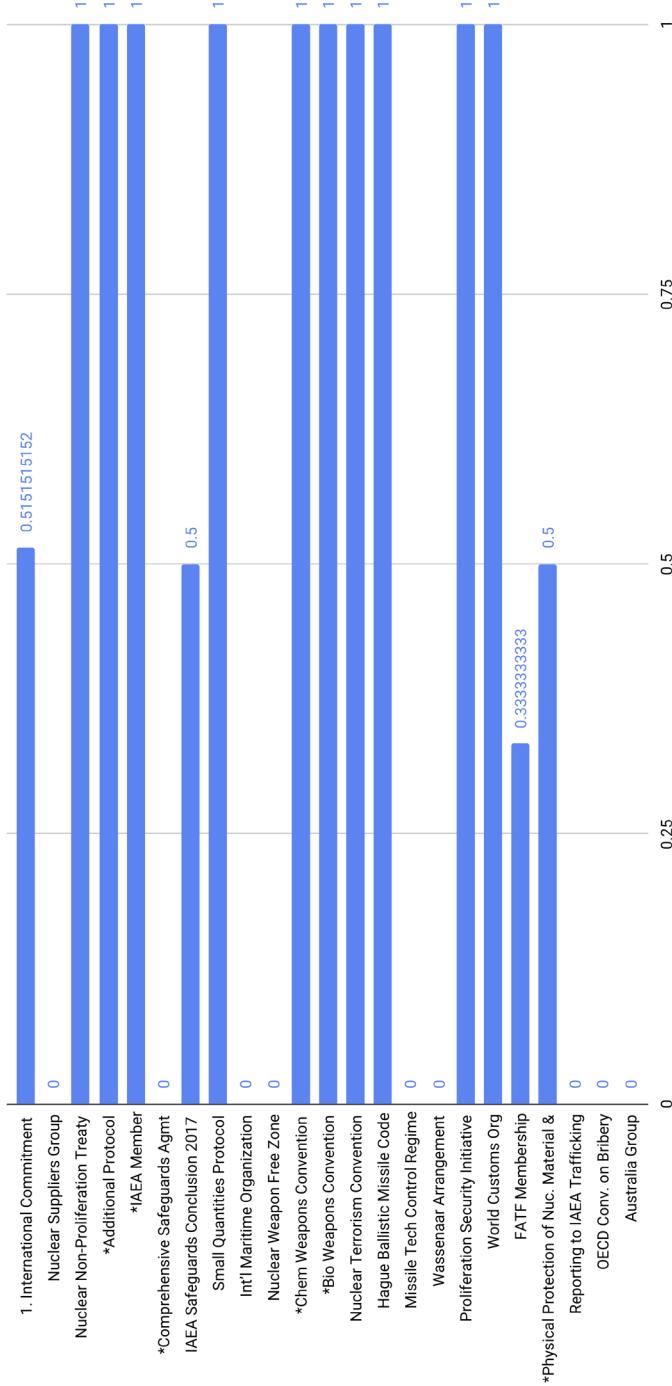


Figure 7.4. Example of a performance fraction graph.

POINT DEFICIT CHART

As performance fractions show the extent to which sub-criteria and super criteria were fulfilled, but not how the performance in each criterion impacts the final PPI score, we developed PPI point deficit charts. Factoring in the sub-criteria impacts (high, medium, or low) and the super criteria weights (100, 200, or 400 points), these charts show where final PPI points were received and where points are missing. Figure 7.5 shows an example. Points that Afghanistan received toward its final PPI score under *International Commitment* are visualized in blue, while points that are still missing are in red.

2019 Afghanistan Points and Deficits: International Commitment

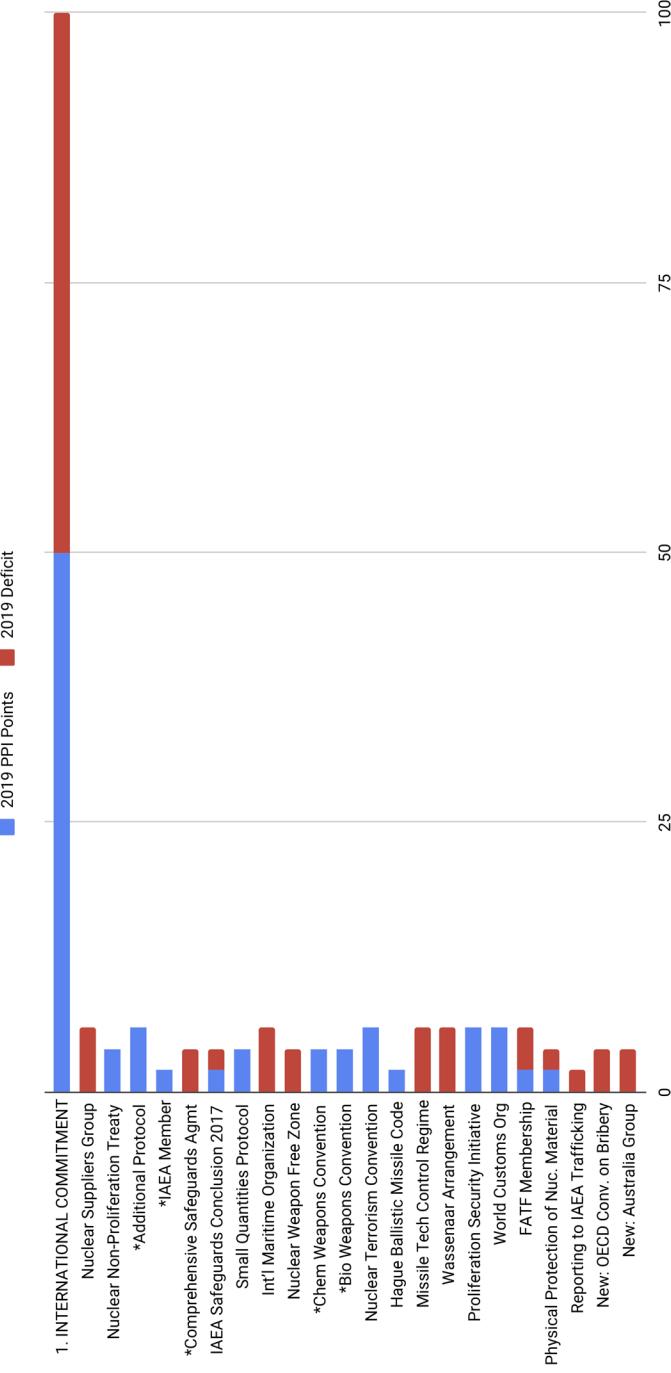


Figure 7.5. Example of a Point Deficit Chart for Super Criterion *International Commitment*.

UNCERTAINTIES IN THE PPI METHODOLOGY

The PPI has a number of uncertainties that affect the accuracy of the rankings. The largest uncertainty is created by lack of data. The project initially developed vastly more sub-criteria for each super criterion than staff could find data for, a particularly difficult endeavor when one must find data for the bulk of 200 countries before deciding to include the sub-criterion in the scoring system. In many cases, countries do not provide relevant information, or the 1540 Committee does not collect relevant information in the 1540 matrices or other data sources. In other cases, countries do not publish relevant information and thus receive zero points on that sub-criterion. As a result, the project encourages countries to pay close attention to their 1540 matrices and submit information to the 1540 Committee accordingly. Reports should include a reference to the appropriate matrix entry and reference to or copies of relevant legislation and appropriate explanations. Reports should be updated as needed.¹ Another recommendation is that countries should fulfill the additional sub-criteria footnoted in the super criteria sections that were not used by the PPI to derive a total score.

Another uncertainty involves the difficulty of determining specific, measurable criteria to evaluate the effectiveness of trade controls. The process is ongoing and comments are always welcome.

The project depended on expert judgment in the adding and subtracting of points under the *Ability to Prevent Proliferation Financing* super criterion and in subtracting points under the *Adequacy of Enforcement* super criterion. Although a wide variety of experts were consulted, this approach, in the end, entails some subjectivity. On balance, the use of experts was viewed as making the PPI sounder and more credible.

Despite the difficulties in finding all the desired data and other uncertainties, the staff on the project believe they collected enough data involving 101 indicators to rank the 200 countries, territories, or entities in the PPI. However, the total scores, and thus the ranks, should not be considered without due acknowledgement of the uncertainties. Overall, a variation in the total PPI point score of up to plus or minus 50 points is not viewed as significant. This equates to a percentage uncertainty of almost seven percent, where the total possible point range is -200 to 1,300 points.

NOTE

1. In UN Security Council resolution 2325 (2016), the Security Council encouraged all states that have submitted reports to provide additional information to the 1540 Committee on their implementation of Resolution 1540 (2004), including, voluntarily, on their laws and regulations and on effective practices; to prepare, on a voluntary basis, national implementation action plans mapping out their priorities and plans for implementing the key provisions of Resolution 1540 (2004); and to submit these plans to the Committee.

SECTION II

THREE FUNDAMENTAL TIERS

CHAPTER 8

DEFINING THE THREE TIERS

The PPI generates a score for each of the 200 countries, territories, and entities it considers to measure the effectiveness of strategic trade control systems. However, not all countries face the same challenges and priorities in creating and implementing trade control systems. Resources available for doing so also vary. As a result, the PPI project presents its findings in terms of tiers of similar countries with respect to trade control challenges and requirements. This tiering approach is unique in its categorization of countries compared to other indices. Instead of assessing countries only by a full ranking and comparing them against one another—for example, regardless of whether they are small island nations without significant international trade or a major world economy—the project separates countries into three basic, mutually-exclusive tiers. This manner of evaluating countries acknowledges that smaller countries, and countries that trade less and have fewer resources to devote to trade controls, cannot realistically be expected to match the performance of major world economies. The tiering system allows for a more relevant comparison of countries' ranks among peers in their potential to prevent strategic commodity trafficking. It also serves to create a more transparent method to improve trade controls among peer countries.

The PPI tiering system supports, and hopes to assist, the work of the 1540 Committee, which is urged under Resolution 2325 (2016) to “continue to explore and develop an approach, with regard to implementation

and reporting, that takes into account the specificity of States, inter alia, with respect to their ability to manufacture and export related materials, with a view to prioritizing efforts and resources where they are most needed without affecting the need for comprehensive implementation of resolution 1540 (2004)."¹

The definitions of the three tiers have remained the same as in the previous version of the PPI. However, the tier assignments changed for five countries, as discussed below.

The three tiers are defined in broad terms as:

Tier One: Major suppliers of, or capability to supply, nuclear facilities and components, and nuclear-related commodities and ballistic missile, other WMD, and related strategic commodities.

Tier Two: Potential nuclear, ballistic missile, WMD, and related strategic commodity transshipment countries with limited supply potential. These countries may have limited capabilities to manufacture dual-use items, or they may have limited nuclear infrastructure in place, such as nuclear research or power reactors or uranium mines.

Tier Three: All other countries.

TIER ONE COUNTRIES:

Tier One is comprised of 55 countries, namely the countries known to possess nuclear weapons, other countries or entities that are members or adherents of the Nuclear Suppliers Group, and a few additional countries with otherwise extensive nuclear capabilities. NSG membership is considered under Tier One because membership requires that a country be a supplier of at least some goods on the NSG nuclear direct- and dual-use lists. This tier includes countries with past, alleged nuclear weapons programs or extensive nuclear research, such as Argentina, Brazil, and Taiwan. As a group, Tier One countries pose the greatest risk of being suppliers of some of the most sensitive WMD and ballistic missile commodities.

Countries in Tier One include the following:

Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, DPRK, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Iran,

Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mexico, Monaco, Netherlands, New Zealand, Norway, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, the United Kingdom, and the United States.

Monaco, Liechtenstein, and San Marino are considered part of Tier One because of their close legal association with France, Switzerland, and Italy, respectively. In the 2019 PPI, San Marino was reassigned to Tier One. (It was in Tier Three in 2017, while Monaco and Liechtenstein were already in Tier One). Taiwan is included, despite its special international status. A lack of information associated with its special status made it difficult to obtain a thorough 2017 ranking, however, after receiving more information from meetings with Taiwanese officials, we are more confident in our 2019 ranking for Taiwan.

TIER TWO COUNTRIES:

Tier Two is comprised of 61 countries that are broadly defined as potential strategic commodity transshipment countries. They do not have extensive nuclear or other sensitive commodity supply capabilities, but nevertheless pose a risk of illicit or unauthorized supply, facilitation, or transfer of such commodities. Tier Two countries include those that: are major traffic locations for land, sea, and air containers; are major financial hubs; possess significant manufacturing capabilities; have small nuclear facilities under safeguards; or are exporters of uranium.² Many Tier One countries would also meet these conditions, such as Canada and the United States, but they have greater nuclear, WMD, and missile supply potential that qualify them for Tier One.

The financial hubs were determined by amounts of countries' illicit money outflows.

Based on these criteria, the 61 countries in Tier Two are the following, alphabetically:

Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Bahamas, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Chile, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Hong Kong, Indonesia, Iraq, Jamaica,

Jordan, Kuwait, Kyrgyzstan, Lao People’s Democratic Republic, Lebanon, Libya, Madagascar, Malawi, Malaysia, Malta, Moldova (Rep of the), Mongolia, Morocco, Namibia, Nicaragua, Niger, Nigeria, Oman, Panama, Paraguay, Peru, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Tajikistan, Tanzania (United Rep of), Thailand, Tunisia, Uganda, United Arab Emirates, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic of), Viet Nam, and Zambia.

Cyprus and Malta were moved from Tier One to Tier Two for 2019 because the PPI was informed that they joined the NSG on the grounds of transshipment capability. Egypt was originally in Tier One, as it is one of 20 countries able to produce “Complete rocket systems (including ballistic missiles, space launch vehicles, and sounding rockets) capable of delivering at least a 500 kg ‘payload’ to a ‘range’ of at least 300 km,” according to the Missile Technology Control Regime Annex Handbook for 2017. For 2019, Egypt was moved to Tier Two because it has only limited nuclear capabilities. Jordan was moved from Tier Three to Tier Two because it started operating a small nuclear research reactor.

Syria’s placement was subject to extensive discussion and comments but remained in Tier Two in this version, despite its WMD capabilities, including the use of chemical weapons against its people. As Syria recovers from its civil war, its placement will be reassessed in the next version of the PPI.

TIER THREE COUNTRIES:

This tier encapsulates all the remaining countries that are not included in Tiers One or Two.

The 84 countries in Tier Three are the following:

Andorra, Angola, Antigua and Barbuda, Bahrain, Barbados, Belize, Benin, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Côte d’Ivoire, Cuba, Djibouti, Dominica, El Salvador, Equatorial Guinea, Eritrea, Fiji, Gabon, Gambia, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See, Honduras, Kenya, Kiribati, Kosovo, Lesotho, Liberia, Macedonia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia (Federation of), Montenegro, Mozambique,

Myanmar, Nauru, Nepal, Niue, Palau, Palestine (State of), Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Suriname, Swaziland, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Turkmenistan, Tuvalu, Uruguay, Yemen, and Zimbabwe.

DISTRIBUTION OF TIERS' AVERAGE AND MEDIAN SCORES

The results for each tier are discussed in the next three chapters. Here, it is useful to summarize the tiers' average and median scores (Figure 8.1).

The average for Tier One is 769 points out of 1,300 points, which is about 300 points higher than the Tier Two average. This difference reflects the participation of Tier One countries in the major trade control arrangements, such as the Nuclear Suppliers Group, as well as their adherence to the major international nonproliferation treaties, conventions, and other relevant instruments. The NSG demonstrates the value of such groups of suppliers advancing shared values and creating, improving, and promoting effective strategic trade controls. Non-NSG member countries in Tier One that adhere or seek to adhere to regime guidelines help contribute to the advancement of these values and to the effective systems of control that normally accompany them.

Tiers Two and Three have averages of 467 and 321 points, falling below half of the maximum points possible, and below a quarter, respectively.

Figure 8.1 showcases an underlying problem in the global effort to combat strategic commodity trafficking. For developed countries, controlling trade is a matter of national security to which they accordingly dedicate resources. For many other countries, however, trade is mainly regulated for economic reasons, and, compared to Tier One countries, Tiers Two and Three countries generally have fewer available financial and technical resources. Items crossing borders are controlled mainly to collect tariffs. For example, in many developing economies, import controls are in place, while export controls are minimized in order to increase income and decrease trade deficits.

To an extent, lower scores in Tiers Two and Three result from those countries' lack of perceived need for substantial trade control systems and fewer resources available to adopt and implement such controls.

Nonetheless, a general recommendation is that countries in Tiers Two and Three should create or improve viable strategic trade control systems by adopting both the legislation necessary to control the export, transit, transshipment and re-export of strategic goods, and by putting in place the appropriate control lists (see below for further discussion on this issue).

No country received more than 80 percent of the total points, and three countries received negative scores. The former indicates that even those states with above-average strategic trade controls can improve the effectiveness of their controls. For those countries that received less than 10 percent of the points—Sudan, Afghanistan, Palestine, Iran, Somalia, South Sudan, and North Korea, responsible suppliers and transshipment countries should exercise extreme caution when trading with them.

2019 Average and Median Scores

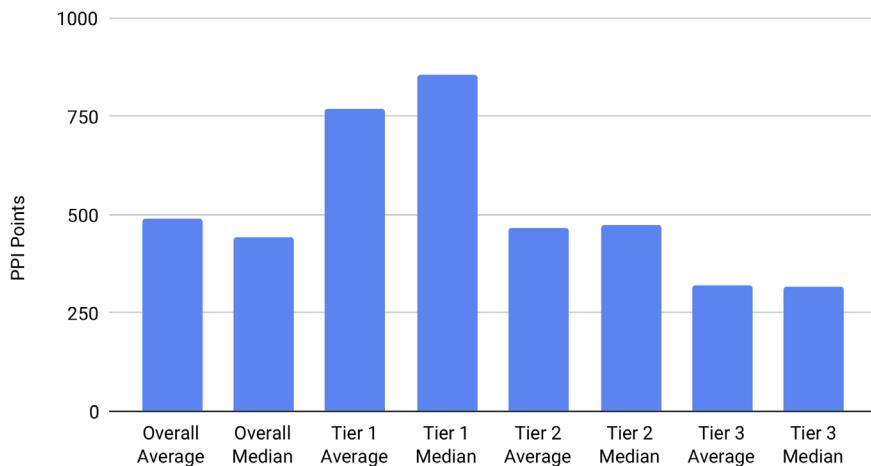


Figure 8.1. Average and median scores in the overall PPI and the three tiers.

The overall average is 489 points and the overall median is 443 points. As can be seen, Tier One did considerably better than Tiers Two and Three.

NOTES

1. See: United Nations Security Council, *Security Council Resolution 2325 (2016)*, S/RES/2325, December 15, 2016, [https://undocs.org/S/RES/2325\(2016\)](https://undocs.org/S/RES/2325(2016))
2. The major land and air transshipment locations were measured in terms of freight in metric tonnes, and the top sea locations were measured in terms of twenty-foot equivalent units (TEU). The top twenty to thirty entries were selected from each list. Many countries were in the top of two or more of the lists or in Tier One, further narrowing the Tier Two list. The major financial hubs were determined by picking the countries with the largest amount of illicit money outflows. Sources: International Union of Railways, “Railway Statistics,” Paris, France, 2014, http://www.uic.org/IMG/pdf/synopsis_2014.pdf; World Shipping Council, “Top 50 World Container Ports,” 2015, <http://www.worldshipping.org/about-the-industry/global-trade/top-50-world-container-ports>; Airports Council International, “International Freight Traffic Monthly Ranking,” December 2015, updated April 2016, <http://www.aci.aero/Data-Centre/Monthly-Traffic-Data/International-Freight-Traffic/Monthly>; Dev Kar and Joseph Spanjers, “Appendix Table 5. Illicit Hot Money Narrow Outflows (HMN),” in *Illicit Financial Flows from Developing Countries: 2004-2013* (Washington, D.C.: Global Financial Integrity, 2015), <http://www.gfiintegrity.org/report/illicit-financial-flows-from-developing-countries-2004-2013/>; United Nations Industrial Development Organization, “Industrial Development Report 2016—The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development,” United Nations Publications, http://www.keepeek.com/Digital-Asset-Management/oecd/economic-and-social-development/industrial-development-report-2016_a1cf26ea-en#.
WTcW72jyuUk#page1; U.S. Department of the Interior and United States Geological Survey, “Mineral Commodity Summaries 2016,” U.S. Geological Survey, Reston, Virginia, 2016, <https://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf>; OECD and Nuclear Energy Agency, “Uranium 2014: Resources, Production and Demand,” 2014, <https://www.oecd-nea.org/ndd/pubs/2014/7209-uranium-2014.pdf>

CHAPTER 9

TIER ONE RANKING

Tier One is composed of 55 countries capable of supplying countries with goods needed to create the wherewithal to build nuclear weapons. San Marino was moved to Tier One from Tier Three for 2019.

Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, DPRK, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mexico, Monaco, Netherlands, New Zealand, Norway, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, the United Kingdom, and the United States.

Table 9.1 (and Figure 9.1) show the rankings of the countries in Tier One. The average score in Tier One is 769 points (up from 710 in 2017) out of a possible 1,300 points. The median is 857, also up from 2017, where it was 822. The difference between the average and median scores reflects the large range of points achieved by members of the tier.

The reader is cautioned not to assign too much precision to close rankings between countries in the table. Countries ranked close to one another do not differ substantially in the effectiveness of their trade control systems.

Large differences in total points matter in the Tier One ranking. A country that achieved at least two-thirds of the total points, or about 870 points out of the total 1,300 possible points, is viewed as having a high-scoring trade control system (27 countries), although improvements are always necessary. A score below 50 percent of the total points means that these countries need to do significant work to improve their trade control systems (11 countries). Those in between need to take some steps to improve their controls (17 countries). Figure 9.2 shows the number of countries in each of these percentage ranges.

Out of a total possible score of 1,300 points, the highest scorer in Tier One (and also in the full ranking of all 200 countries) was, as in 2017, the United States, with 1,019 points.¹ It received 78 percent of the total possible points. Top scorers were mostly Western countries.

TIER ONE IN THE OVERALL RANKING

Forty-four of the 55 countries in Tier One rank in the top 25 percent of the overall PPI ranking. The full ranking of all 200 countries is included in Annex I of this report. This result shows that Tier One countries have, in general, the most developed trade controls of the 200 countries, territories, or entities. However, seven countries only achieved a ranking between 51 and 100 in the PPI overall, and four ranked below 100 in the total ranking.

Tier One countries that ranked in the bottom half of the overall ranking included, from higher to lower ranking: Pakistan, Belarus, Iran, and the DPRK.

Iran and North Korea received less than 10 percent of the achievable points, with North Korea's score being negative. These scores reflect their trade control systems not meeting international standards and their wide-scale illicit procurements.

TIER 1 PERFORMANCE FRACTIONS—HOW COUNTRIES CAN IMPROVE

Although a country's total score is the fundamental measure of the effectiveness of its trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the performance fraction charts the extent to which countries have met the sub-criteria. For example, if the PPI assigned 0, 5, or 10 points for a country's adherence to the Additional

Protocol (0 would entail no signature or ratification, 5 would signify signature but not ratification, and 10 would signify points for full ratification), the performance fractions would assess those base points awarded to each country before weighting as low, medium, or high impact. It does not factor in any negative indicators, such as points deducted for having sanctioned entities. Performance fractions, in fact, allow for a basic assessment of where points were *not* received. Please refer back to Chapter 7: Total Weighted Score and Rank for a longer discussion of performance fractions.

The performance fraction can also be tabulated for the entire tier. Given that two out of the 55 countries in Tier One are countries under international sanctions for proliferation-related activities (the DPRK and Iran), one hundred percent performance by the countries in this tier is not possible. These two countries account for 0.04 in the performance fraction, meaning in Figures 9.3-9.8, Tier One countries can maximally achieve a performance fraction of 0.96. Nevertheless, as seen in Figure 9.3, near-perfect performance is not achieved, in any case, by Tier One under any super criterion. The *Legislation* super criterion comes the closest, with 90 percent fulfillment of its sub-criteria. Tier One countries barely reached 75 percent under *International Commitment* and *Adequacy of Enforcement*. Performance under *Ability to Monitor and Detect Strategic Trade* and *Enforcement* fell short of 75 percent, reaching the 65 and 71 percent marks, respectively, while *Ability to Prevent Proliferation Financing* fell short of even that, showing only 53 percent fulfillment.

Individual country performance fractions are not included in this report but are available upon request.

SCORE AND PERFORMANCE BY SUPER CRITERIA

The Tier One countries varied in their scores under each super criterion.

INTERNATIONAL COMMITMENT

Tier One countries, in general, are committed to international conventions, bodies, and regimes relating to non-proliferation. Forty-four of the 55 countries achieved two-thirds or higher of the possible points under this super criterion.² Four countries received less than two-thirds but

more than half of the possible points. Some of the countries that received less than half of the possible points were Pakistan, Iran, and the DPRK.

The performance fractions show that under the *International Commitment* super criterion, near-perfect performance (96 percent) is achieved under three sub-criteria (see Figure 9.4). Based on sub-criteria that are less than 75 percent fulfilled, there is room to add to the tier's memberships in the Australia Group, the FATF, and the Missile Technology Control Regime.

LEGISLATION

Overall, countries in Tier One did well in their enactment of trade control-relevant legislation, with 43 of the 55 countries receiving 90 percent or more of the possible points in this super criterion. Looking at the quality of export control legislation, all except two countries have legislation that placed them in the most developed category, namely Dark Green (see Chapter 3, Table 3.2, for a discussion of how quality of legislation is characterized.) Notable exceptions are Iran and the DPRK, which lack robust export control legislation and are categorized as Red. As expected, Figure 9.5 shows that the performance fraction exceeds 0.75 or 75 percent under all but one sub-criterion.

ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Tier One did not perform as well under this super criterion as compared to Super Criterion *International Commitment* and Super Criterion *Legislation*. Here, the top country, the Netherlands, received 76 percent of the possible points in the *Ability to Monitor and Detect Strategic Trade* super criterion. Roughly half of the 55 countries achieved at least two-thirds of the possible points under this super criterion. The next 20 countries in the ranking garnered at least half of the possible points but did not reach the two-thirds threshold. The remaining seven countries scored less than half of the possible points under this super criterion. This suggests that while Tier One countries generally have the legislative basis for trade controls, many lack the ability to effectively monitor and detect illicit trade.

In terms of performance fractions, Figure 9.6 shows that less than half of all sub-criteria (8 out of 19) reached or exceeded a fraction of 75 percent. Examples of sub-criteria that need improvement across the tier

are physical inspections of cargo; transparency of doing business, especially starting a business; and efficiency of customs clearance processes, including having better training and more sophisticated equipment for those processes.

ABILITY TO PREVENT PROLIFERATION FINANCING

Countries scored the worst in their *Ability to Prevent Proliferation Financing*. The top country received only 69 percent of the possible points in this criterion, with the second country achieving 63 percent of the possible points. The tenth country, followed by the remaining 45 countries, achieved less than half of the possible points in this super criterion. The bottom three countries had negative scores: Serbia, the DPRK, and Iran. Similar to Super Criterion *Ability to Monitor and Detect Strategic Trade*, while countries appear to have the legislative basis to prevent illicit trade, many lack the ability to prevent the flow of money that finances it.

The performance fraction of countries is lowest in the prevention of proliferation financing. Figure 9.7 shows that Tier One countries fulfilled only one of the sub-criteria to 75 percent, namely Egmont Group membership. A general observation is that Tier One countries need to work more closely with the FATF and its regional bodies on proliferation financing, and improve compliance with proliferation financing-relevant FATF recommendations. A new sub-criterion added in 2019, namely having a public registry of company beneficial ownership, also shows need for improvement.

ADEQUACY OF ENFORCEMENT

Generally, the data show that Tier One countries have the capacity and willingness to enforce trade control regimes. Down from 39 in 2017, only 30 of the 55 countries garnered at least two-thirds of the possible points under this super criterion, with the top five countries achieving 85 percent or higher. Nine countries received at least half, but not two-thirds, of the points under this super criterion. The following countries received particularly low scores: Iran, Russia, Belarus, and the DPRK. Many of the poorly performing countries appear to lack either the will or capacity to enforce their trade control regimes, which is particularly concerning given their potential for proliferating nuclear-related goods.

The performance fraction for the *Adequacy of Enforcement* super criterion shows that barely half of the sub-criteria (11 out of 24) are fulfilled to more than 0.75 (see Figure 9.8). Areas where countries can improve are putting in place better voluntary disclosure procedures for trade control violations, allowing customs checks in Free Trade Zones, making their export control lists easily accessible, establishing national nuclear industry associations, and developing better abilities to conduct investigations.

2019 Tier One Rank

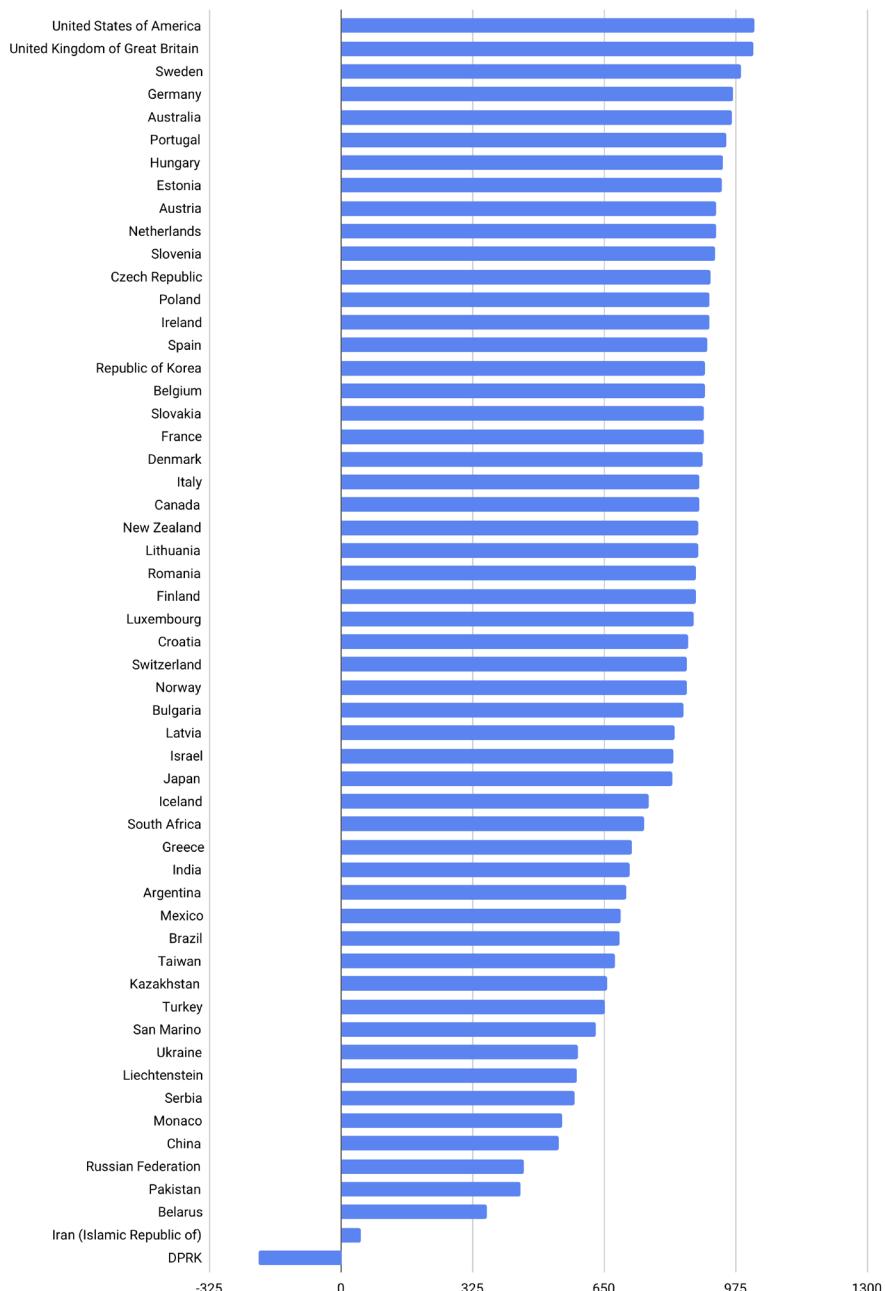


Figure 9.1. Total points received by each country in relation to the total possible points (1,300). The vertical line at 650 represents the 50 percent marker.

2019 Scores of Tier One Countries

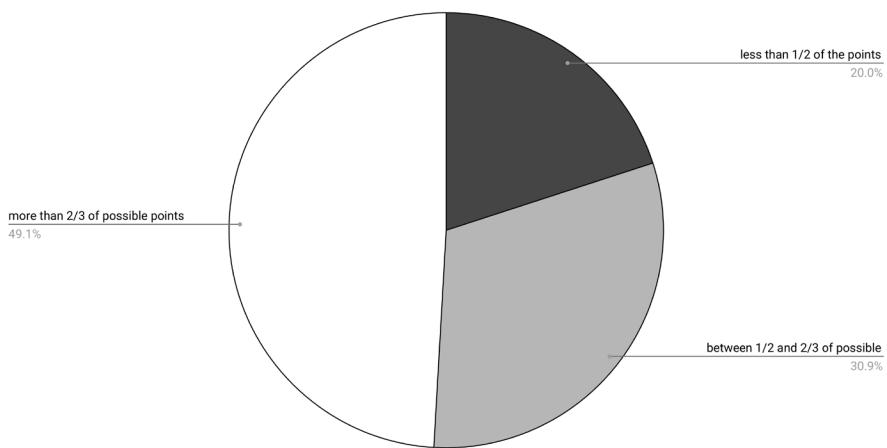


Figure 9.2. Scores presented as a fraction of total points. Twenty-seven, or about one-half, of the Tier One countries received more than two-thirds of the points. About one-third of Tier One countries received between one half and two-thirds of the total points, and about one-fifth of these countries received less than half of the points.

2019 Tier One: Comprehensive PPI Performance Fractions

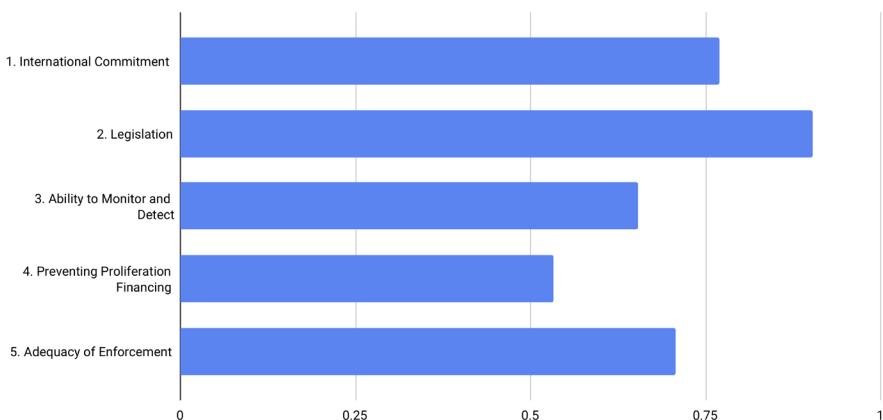


Figure 9.3. Extent to which the super criteria were fulfilled by Tier One as a group.

2019 Tier One: International Commitment Performance Fractions

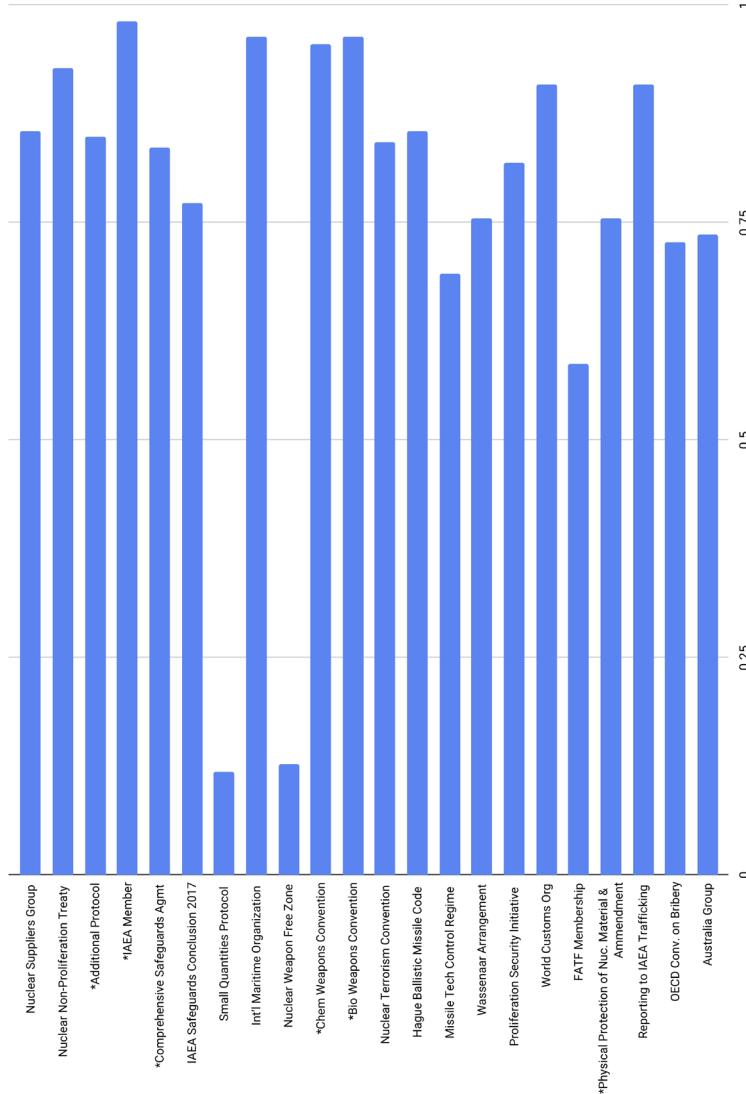


Figure 9.4. Extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier One as a group.

2019 Tier One: Legislation Performance Fractions

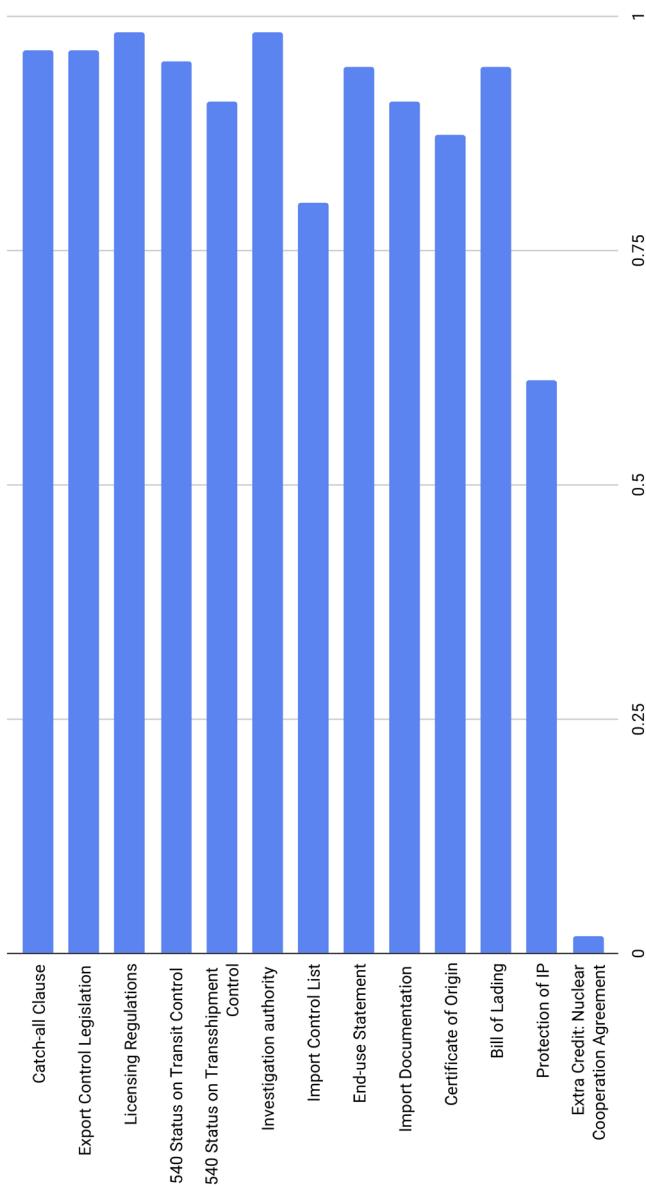


Figure 9.5. Extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier One as a group.

2019 Tier One: Ability to Monitor and Detect Strategic Trade Performance Fractions

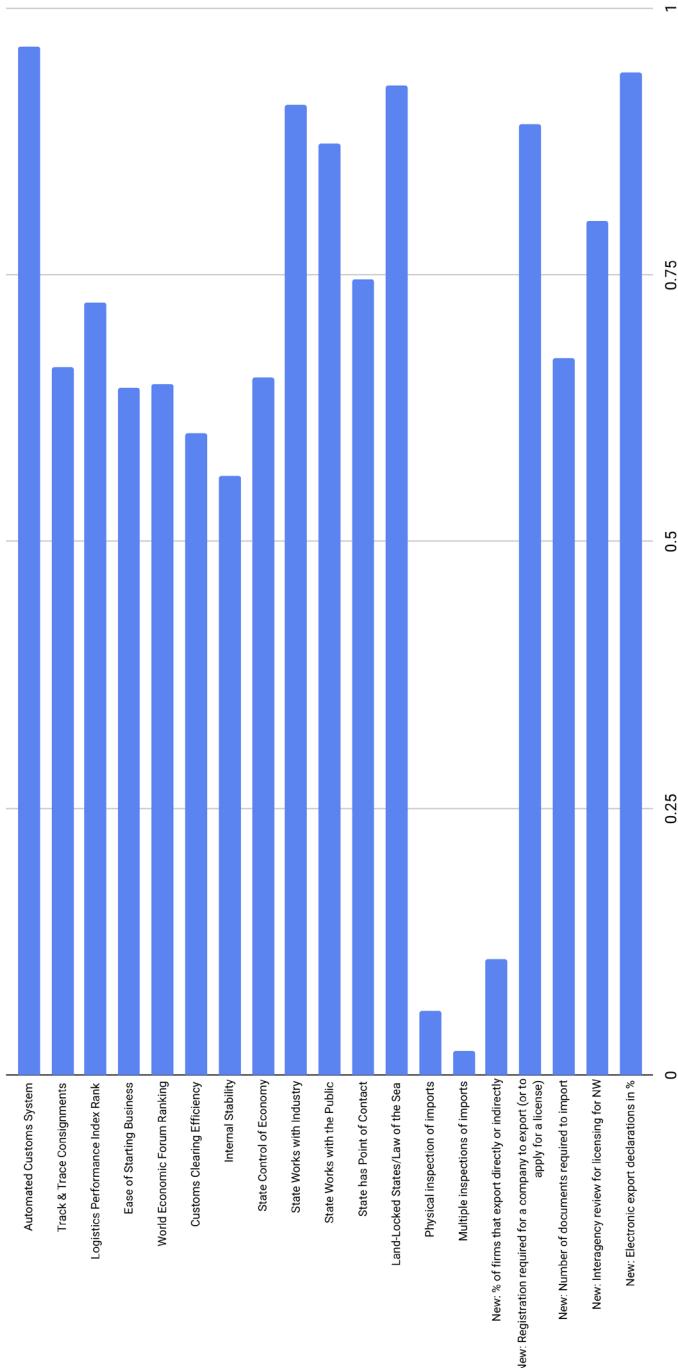


Figure 9.6. Extent to which sub-criteria making up the Ability to Monitor and Detect Strategic Trade super criterion were fulfilled by Tier One as a group.

2019 Tier One: Preventing Proliferation Financing Performance Fractions

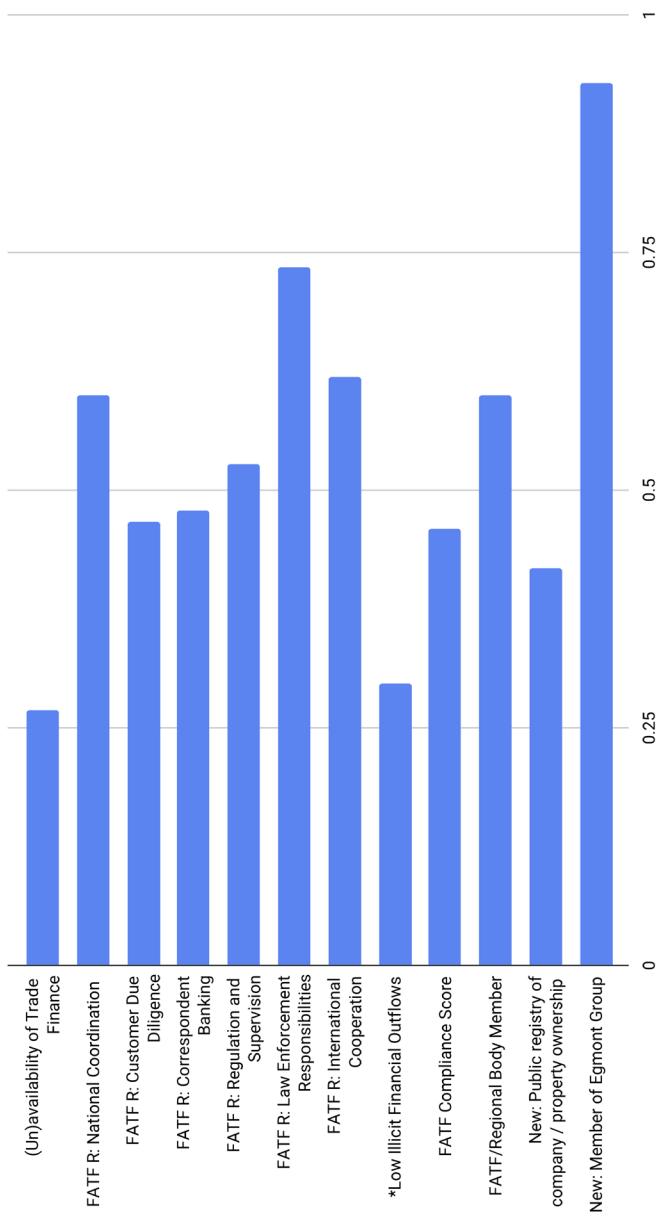


Figure 9.7. Extent to which sub-criteria making up the Ability to Prevent Proliferation Financing super criterion were fulfilled by Tier One as a group.

2019 Tier One: Adequacy of Enforcement Performance Fractions

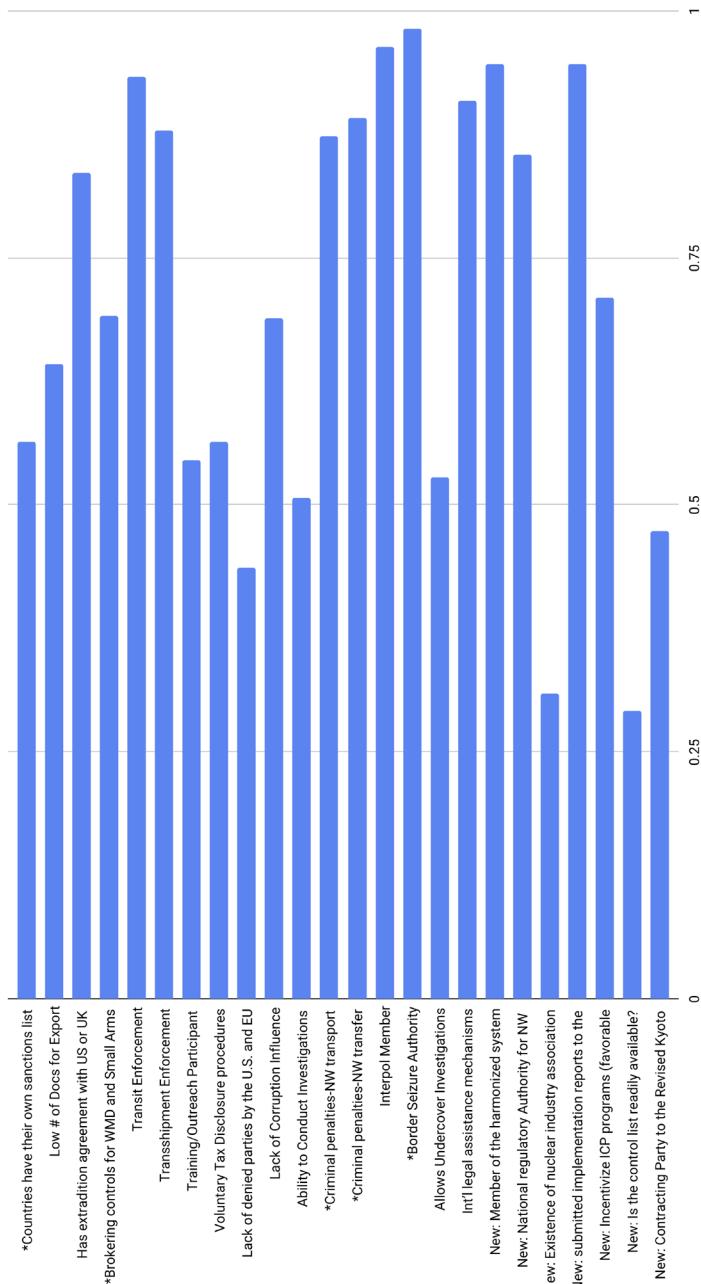


Figure 9.8. Extent to which sub-criteria making up the *Adequacy of Enforcement* super criterion were fulfilled by Tier One as a group.

CHAPTER 9

TIER RANK	COUNTRY	TOTAL POINTS
1	United States of America	1019
2	UK (Great Britain & Northern Ireland)	1018
3	Sweden	987
4	Germany	969
5	Australia	966
6	Portugal	950
7	Hungary	942
8	Estonia	940
9	Austria	927
10	Netherlands	926
11	Slovenia	924
12	Czech Republic	912
13	Poland	910
14	Ireland	908
15	Spain	904
16	Republic of Korea	897
17	Belgium	897
18	Slovakia	896
19	France	896
20	Denmark	894
21	Italy	884
22	Canada	883
23	New Zealand	882
24	Lithuania	882
25	Romania	876
26	Finland	876
27	Luxembourg	871

TIER RANK	COUNTRY	TOTAL POINTS
28	Croatia	857
29	Switzerland	854
30	Norway	854
31	Bulgaria	845
32	Latvia	823
33	Israel	821
34	Japan	818
35	Iceland	759
36	South Africa	749
37	Greece	718
38	India	713
39	Argentina	704
40	Mexico	691
41	Brazil	688
42	Taiwan	677
43	Kazakhstan	657
44	Turkey	650
45	San Marino	630
46	Ukraine	584
47	Liechtenstein	583
48	Serbia	575
49	Monaco	546
50	China	537
51	Russian Federation	452
52	Pakistan	444
53	Belarus	360
54	Iran (Islamic Republic of)	49
55	DPRK	-205

Table 9.1. 2019 Rank of Tier One countries, including total points received.

NOTES

1. We note that as a U.S.-based organization, our ranking of the United States as first in Tier One and in the overall rankings is awkward, as we strive to determine rankings without bias toward our national system. However, this result is not surprising given the United States' strong focus on counter-proliferation financing and enforcement, and given the PPI's own strong focus on proliferation financing and enforcement in determining rankings. The United States' score is high particularly on enforcement of trade controls. However, it is important to point out that the U.S. trade control system overall is not ideal by any means, as its total score shows, and even the top scorer can improve its system. For a set of recommendations on ways in which the United States can improve its trade control system, particularly in light of a recent reform process, see: Stricker with Albright, *U.S. Export Control Reform: Impacts and Implications for Controlling the Export of Proliferation-Sensitive Goods and Technologies: A Policy Document for the New President and Congress* (Washington, D.C.: Institute for Science and International Security, May 17, 2017), <http://isis-online.org/isis-reports/detail/u.s.-export-control-reform-impacts-and-implications/20>
2. As noted above, in general, it is not feasible for an entity or country to achieve 100 percent of available points under this super criterion. For example, membership in export control arrangements such as the Nuclear Suppliers Group is by invitation. In addition, some countries with even small amounts of nuclear material or small nuclear facilities cannot have an IAEA Small Quantities Protocol.

CHAPTER 10

TIER TWO RANKING

Tier Two is composed of 61 countries that pose a risk of illicit or unauthorized facilitation, transshipment, or transfer of sensitive commodities and have limited supply potential:

Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Bahamas, Bangladesh, Bosnia and Herzegovina, Brunei Darussalam, Chile, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Hong Kong, Indonesia, Iraq, Jamaica, Jordan, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Libya, Madagascar, Malawi, Malaysia, Malta, Moldova (Rep of the), Mongolia, Morocco, Namibia, Nicaragua, Niger, Nigeria, Oman, Panama, Paraguay, Peru, Philippines, Qatar, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Tajikistan, Tanzania (United Rep of), Thailand, Tunisia, Uganda, United Arab Emirates, Uzbekistan, Vanuatu, Venezuela (Bolivarian Republic of), Viet Nam, and Zambia.

Cyprus, Egypt, and Malta were moved from Tier One to Tier Two in 2019. Jordan was moved to Tier Two from Tier Three.

Table 10.1 (and Figure 10.1) show the rankings of the countries in Tier Two. The average score in Tier Two is 467 points. The median is 475. The scores are more clustered than in Tier One (see Chapter 9).

As with Tier One countries, the reader is cautioned not to assign too much precision to close rankings between countries in Table 10.1. It is the

large differences in total points between Tier Two countries that matter, not a country's particular numerical rank.

Tier Two countries by their nature have not developed trade control systems as extensive as countries in Tier One. This is reflected in the overall scores. However, Tier Two countries cannot be expected to develop trade controls as robust as those of Tier One countries. As a result, in this tier, a cutoff is established for countries that achieved a score of at least half of the total points (650 points out of a total possible 1,300 points). This only accounts for six countries. It should be noted that having surpassed this cutoff does not mean that improvements are not needed. A score below one-third of the total possible points indicates that countries need to do considerable work to improve their trade control systems (25 countries). Those between one-third and half of the total possible points need to improve their systems somewhat (30 countries). This is shown by the pie chart in Figure 10.2.

Although a country's total score is the fundamental measure of the effectiveness of its trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the performance fraction charts the extent to which countries have met each sub-criterion. For example, if the PPI assigned 0, 5, or 10 points for a country's adherence to the Additional Protocol (0 would entail no signature or ratification, 5 would signify signature but not ratification, and 10 would be points for full ratification), the performance fractions would assess those base points awarded to each country before weighting as low, medium, or high impact. It does not factor in any negative indicators. Performance fractions, in fact, allow for a basic assessment of where points were *not* received. Please refer back to Chapter 7: Total Weighted Score and Rank for a longer discussion of performance fractions.

TIER TWO IN THE OVERALL RANKING

Tier Two countries did not do as well as Tier One countries in the overall PPI ranking. Only six countries ranked among the top 50 countries. Half of the remaining countries ranked between 50 and 100, and the other half ranked below 100.

The highest-ranked Tier Two country was Singapore, which ranked 6th overall and achieved 74 percent of the possible points. The

second-highest rank in Tier Two, Malta, which placed 28th in the overall rank, achieved 67 percent of the possible points. Of note, Malta was moved from Tier One to Tier Two in 2019. The third-ranking country, Cyprus, was also newly added to Tier Two. The United Arab Emirates, at rank number four, would be the second-highest ranking country if Malta and Cyprus had not been added to Tier Two.

The performance fractions confirm that collective Tier Two performance has considerable room for improvement (Figure 10.3). As described below, there are many easy fixes that Tier Two countries can make. The top five performing countries, Singapore, Malta, Cyprus, the United Arab Emirates, and Malaysia, could play a role in assisting their peers in this tier.

SCORE AND PERFORMANCE BY SUPER CRITERIA

INTERNATIONAL COMMITMENT

Four of the 61 countries received two-thirds of the total possible points in this super criterion. 44 countries received more than half, but less than two-thirds, of the points. The bottom 13 countries, which received less than 50 percent of achievable points, are, listed from higher to lower ranking: Saudi Arabia, Sri Lanka, Bahamas, Uganda, Lebanon, Brunei, Oman, Venezuela, Ethiopia, Laos, Syria, Egypt, and Hong Kong.

The performance fractions show that satisfactory performance (75 percent of the total points) was achieved under only seven sub-criteria (Figure 10.4), which is down from 2017, where satisfactory performance was achieved under ten sub-criteria. The three sub-criteria where performance dropped are: having an Additional Protocol, having a Comprehensive Safeguards Agreement, and being a party to the Convention on the Physical Protection of Nuclear Material. Under all three sub-criteria, the PPI applied a stricter standard for 2019. For example, in 2019, countries that signed the AP ten years ago or more, but have not entered it into force since, received no points. An asterisk next to the sub-criterion in Figure 10.4 indicates that a methodological change occurred in 2019. All changes are explained in the super criteria chapters.

However, stronger commitment can be shown by participating more actively in organizations such as FATF, by joining initiatives such as the

Proliferation Security Initiative, and by adhering to the standards of global export control groups such as the NSG or the Wassenaar Arrangement. Signed treaties should be implemented, and ratifications should be adopted, in a timely manner. Many of the Tier Two countries offer trade benefits to major global economies, including cheap and fast transshipment opportunities. Therefore, Tier Two countries should not hesitate to take advantage of international organizations and assistance mechanisms. In fact, Tier Two's major global trading partners, including the United States, should demand more participation and visible commitment to preventing commodity trafficking from Tier Two countries.

LEGISLATION

Overall, Tier Two countries were nearly equal in distribution among those “doing well,” “less than adequate,” and “poorly” at having in place trade control-relevant legislation. Nineteen countries received more than two-thirds of the points, and an equal number received more than half but less than two-thirds of the points. The remaining 23 countries received less than half of the possible points. Looking at the evaluation of the quality of export control legislation, Tier Two countries were mixed in their performance as well (see Chapter 3, Table 3.2, for a discussion of how quality of legislation is characterized). Seventeen countries were Dark Green, which denotes comprehensive export control legislation, seven are Light Green, 14 are Yellow, 16 are Orange, and seven are Red.

The following lists countries by the quality of their export control legislation, from higher to lower ranking:

Dark Green (17): Singapore, Malta, Cyprus, United Arab Emirates, Malaysia, Moldova, Armenia, Jordan, Kyrgyzstan, Georgia, Albania, Azerbaijan, Philippines, Bosnia and Herzegovina, Hong Kong, Namibia, and Iraq

Light Green (7): Thailand, Tajikistan, Uzbekistan, Brunei Darussalam, Viet Nam, Lebanon, and Libya

Yellow (14): Chile, Jamaica, Bangladesh, Ghana, Peru, Qatar, Indonesia, Algeria, Sri Lanka, Tanzania, Nicaragua, Morocco, Nigeria, and Uganda

Orange (16): Saudi Arabia, Panama, Malawi, Zambia, Mongolia, Costa Rica, Dominican Republic, Venezuela, Ethiopia, Kuwait, Niger, Ecuador, Paraguay, Laos, Vanuatu, and Syria

Red (7): Tunisia, Oman, Colombia, the Bahamas, Madagascar, Egypt, and Afghanistan

Non-Green categorized countries in this tier should improve their legal basis for export controls and thereby enable more effective implementation and enforcement. 61 percent of Tier Two countries (if including Yellow countries) lack relevant and adequate dual-use and nuclear-related export controls, which is related to their poor performance in the remaining super criteria.

The performance fractions show that these countries need to significantly strengthen their trade control laws and lists (Figure 10.5). Only ten countries include a catch-all clause in their export control legislation. Moreover, legislative controls on transit and transshipment of nuclear-related goods were only found for roughly half of Tier Two countries. Additionally, Tier Two countries with nuclear infrastructure in place especially should protect intellectual property better to ensure that nuclear-related knowledge and information are not proliferated (see Chapter 3 on *Legislation*).

ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Tier Two countries did poorly in their *Ability to Monitor and Detect Strategic Trade*, a significant deficiency since this tier is comprised of transhipment countries. The highest-scoring country, Singapore, achieved 72 percent of the available points. The next 20 countries scored more than 50 percent, while the following 40 countries did not even receive half of the possible points. Indeed, the majority of Tier Two countries are unable to achieve half of the possible points, lacking the capacity, knowledge, or willingness to monitor and detect strategic trade.

The performance fractions show that only three sub-criteria were fulfilled to 75 percent: Using an automated customs system, being a party to the UN Convention on the Law of the Sea, and filing export declarations electronically (see Figure 10.6). The two former measures are supported and promoted by the United Nations. For example, the United Nations

ran a global campaign to implement the ASYCUDA automated customs software, showing that international organizations can help individual countries to increase their ability to monitor and control trade. All other sub-criteria, with the exception of “Number of documents required to import,” are not fulfilled to even 50 percent. While it may take a long time to move up in a World Bank ranking, countries can improve their performance under other PPI sub-criteria rather quickly, such as providing a point of contact for Resolution 1540 implementation, or working with the public and the industry to increase awareness of export-controlled items and often-used illicit trade schemes. Additionally, countries should increase the physical inspection of imports, streamline the import documentation process, and make it a requirement for countries applying for an export license to register in a company database. In this way, a country’s government can more easily keep track of companies involved in sensitive trade.

ABILITY TO PREVENT PROLIFERATION FINANCING

Like Tier One countries, Tier Two countries performed the worst on *Preventing Proliferation Financing*. The top-ranking country received 64 percent of the possible points, the top nine countries received at least one-third of possible points, and the remaining 52 countries scored under 33 percent. Nine countries received between a quarter and a third of the total possible points, and 31 countries scored between zero and 25 percent of possible points. The remaining 12 countries, or roughly one-fifth of Tier Two, received negative points and included the following, listed from higher to lower ranking: Madagascar, Ethiopia, Nigeria, Viet Nam, Nicaragua, Vanuatu, Libya, Morocco, Paraguay, Iraq, Afghanistan, and Laos.

Considering that many of these countries ranked toward the bottom of the Corruption Perceptions Index, it is particularly concerning that as transshipment states, they also lack the ability to prevent proliferation financing. Since the availability or ease of illicit financing facilitates strategic commodity trafficking, it is significant that a majority of Tier Two countries perform so poorly, in general, under Super Criterion *Ability to Prevent Proliferation Financing*, coupled with poor performance under Super Criterion *Ability to Monitor and Detect Strategic Trade*.

The performance fractions reveal why Tier Two countries performed worst at preventing proliferation financing. Only one-third (4 out of 12) of the sub-criteria passed the 50 percent marker (see Figure 10.7). FATF compliance overall and compliance with the selected recommendations remains very poor. All Tier Two countries need to work more closely with the FATF and its regional bodies to implement the FATF recommendations, especially the six recommendations judged as most relevant to preventing proliferation financing. Countries also need to work on financial transparency by maintaining a public registry of company beneficial ownership, and, if none exists, they should establish a financial intelligence unit which could join the Egmont Group and contribute to sharing information on money-laundering schemes, preventative practices, and the like.

ADEQUACY OF ENFORCEMENT

Only three countries achieved at least two-thirds of the total possible points, while the next 7 countries scored above 50 percent but failed to reach the two-thirds mark. The next 34 countries achieved 25-50 percent of the total points. The remaining 17 countries received less than 25 percent of the total points. Of these countries, Egypt, Afghanistan, Lebanon, and Syria received negative scores. Such frequent, poor performance among transshipment countries, their apparent lack of capacity or willingness to enforce trade controls, and their poor ranking in the Corruption Perceptions Index, need to be seen as collectively hindering their non-proliferation efforts.

The performance fractions show that satisfactory performance of 75 percent across the entire tier was achieved under five sub-criteria: Being a member of Interpol; having a border seizure authority; being a member of the harmonized system; having a national regulatory authority for nuclear weapons; and having submitted implementation reports to the UNSC Committee Pursuant to UNSCR 1718 (see Figure 10.8). Three of these five sub-criteria are new 2019 additions, as identified in the figure. Five further sub-criteria were fulfilled to 50 percent, including two that are very important for this tier: making use of training and outreach and of international legal assistance mechanisms. Nevertheless, having means of transit and transshipment enforcement, and allowing customs checks in Free Trade Zones under the Kyoto Convention—arguably the most

important mechanisms in terms of sub-criteria for Tier Two countries—are not fulfilled to 50 percent. In addition, it is notable that submitting the mandatory UNSC Resolution 1718 (2006) implementation report cannot be automatically equated with implementing the resolution. In an analysis of sanctions violations highlighted in the Panel of Experts report on implementation of the resolution, the Institute found that 52 countries engaged in sanctions violations with respect to North Korea from January to September 2017.¹ Twenty-one of those countries belong to Tier Two.

2019 Tier Two Rank

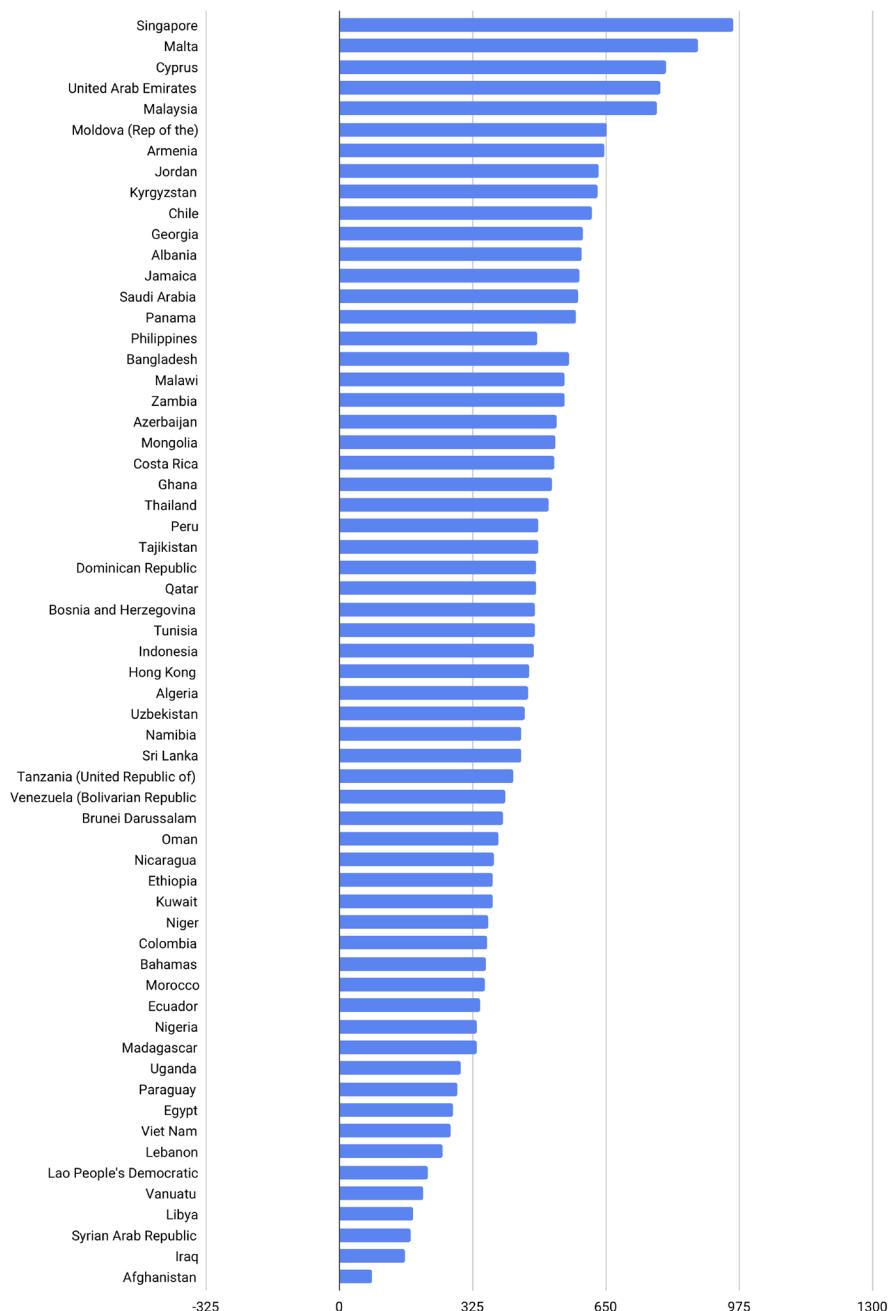


Figure 10.1. Total points received by each country in relation to the total possible points. The points result in the rank.

2019 Scores of Tier Two Countries

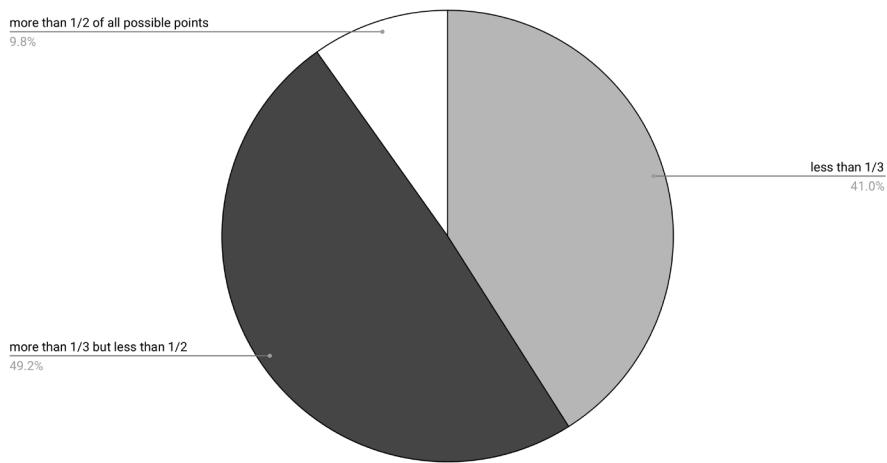


Figure 10.2. Almost half of all Tier Two countries need significant work on their trade controls and more than a third need some work.

2019 Tier Two: Comprehensive PPI Performance Fractions

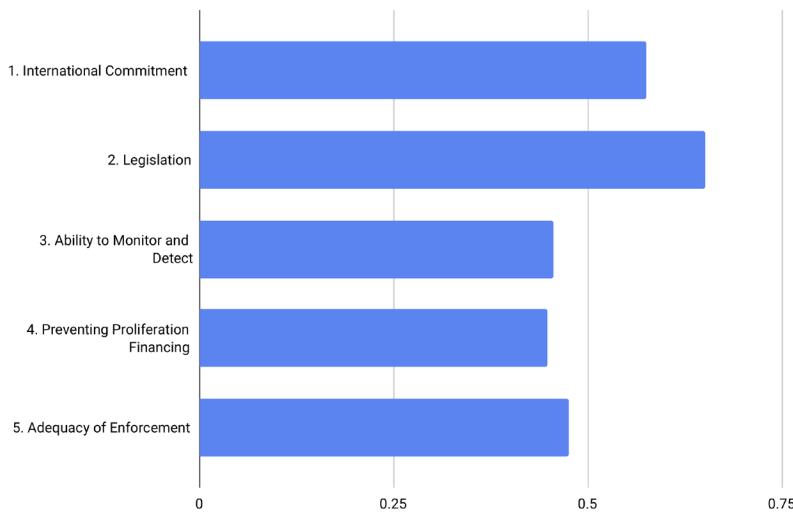


Figure 10.3. The extent to which the super criteria were fulfilled by Tier Two as a group.

2019 Tier Two: International Commitment Performance Fractions

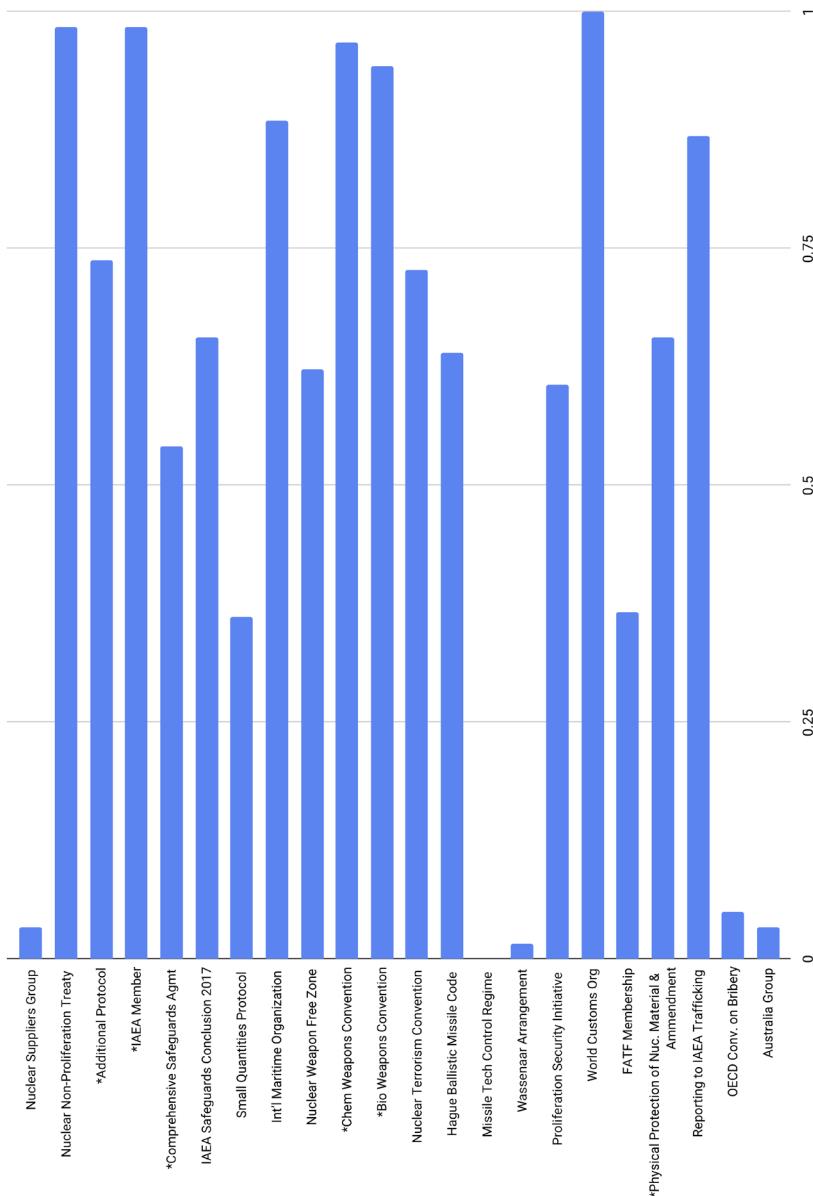


Figure 10.4. The extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier Two as a group.

2019 Tier Two: Legislation Performance Fractions

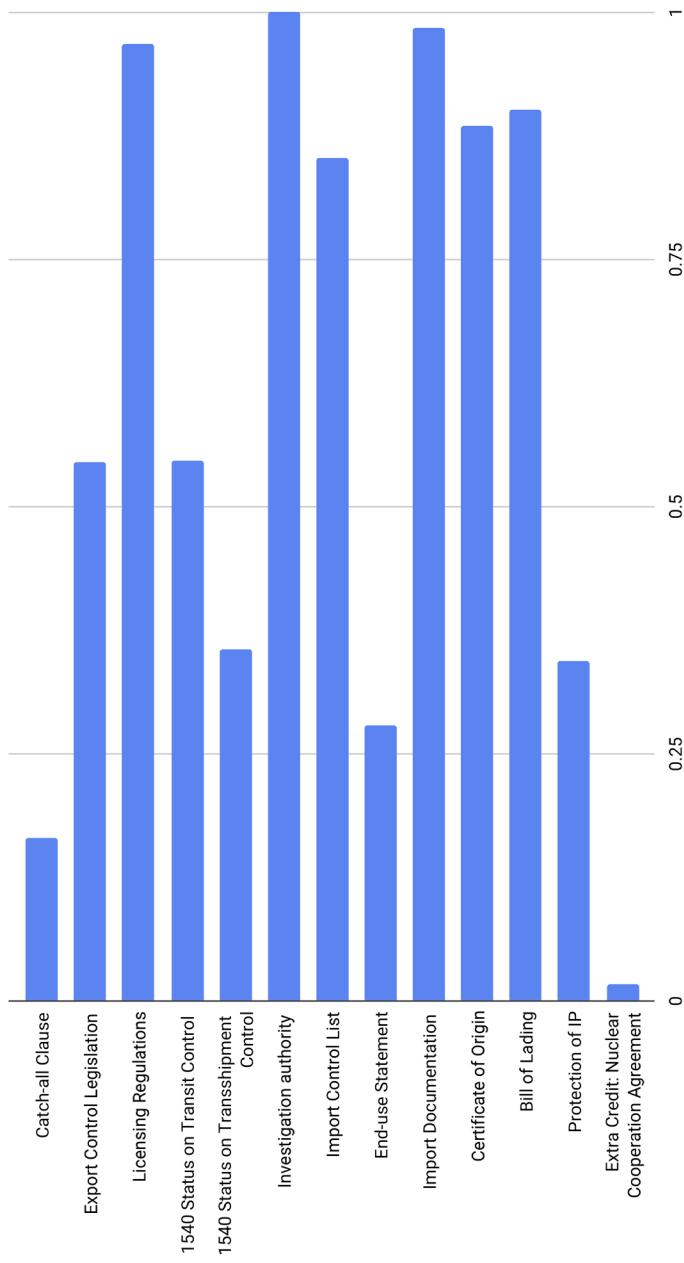


Figure 10.5. The extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier Two as a group.

2019 Tier Two: Ability to Monitor and Detect Strategic Trade Performance Fractions

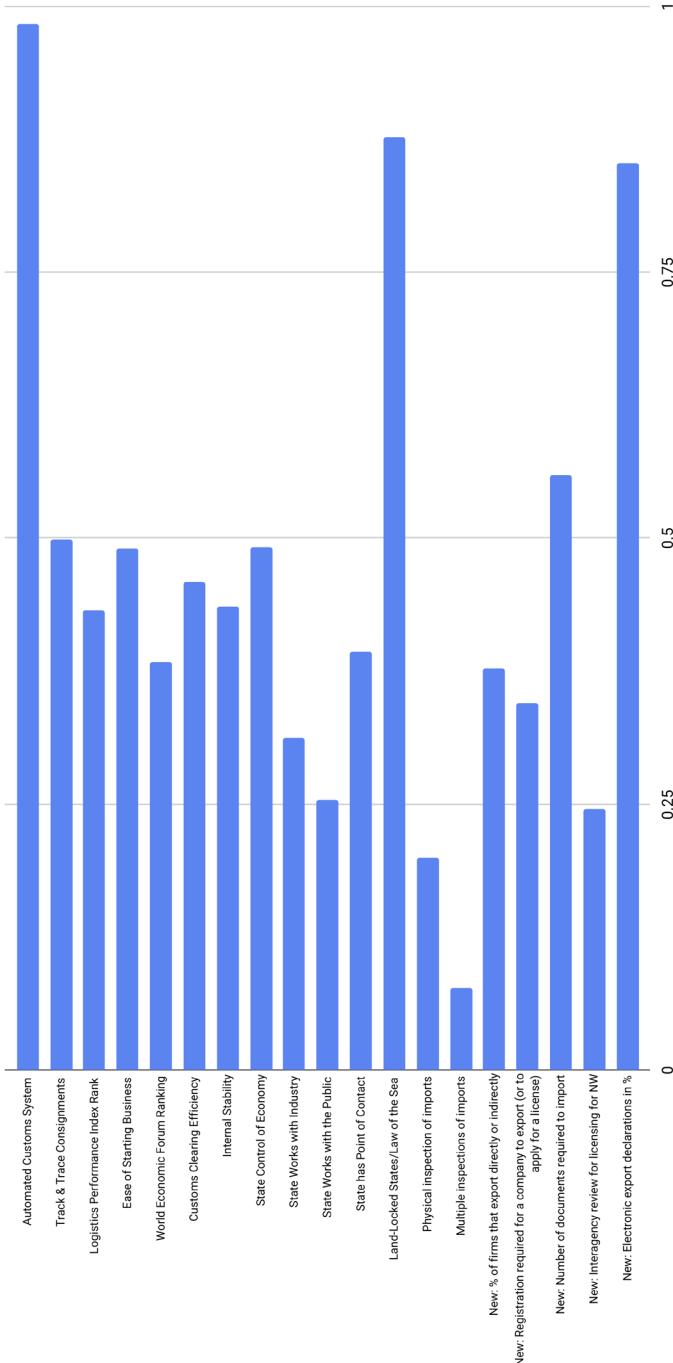


Figure 10.6. The extent to which sub-criteria making up the Ability to Monitor and Detect Strategic Trade super criterion were fulfilled by Tier Two as a group.

2019 Tier Two: Preventing Proliferation Financing Performance Fractions

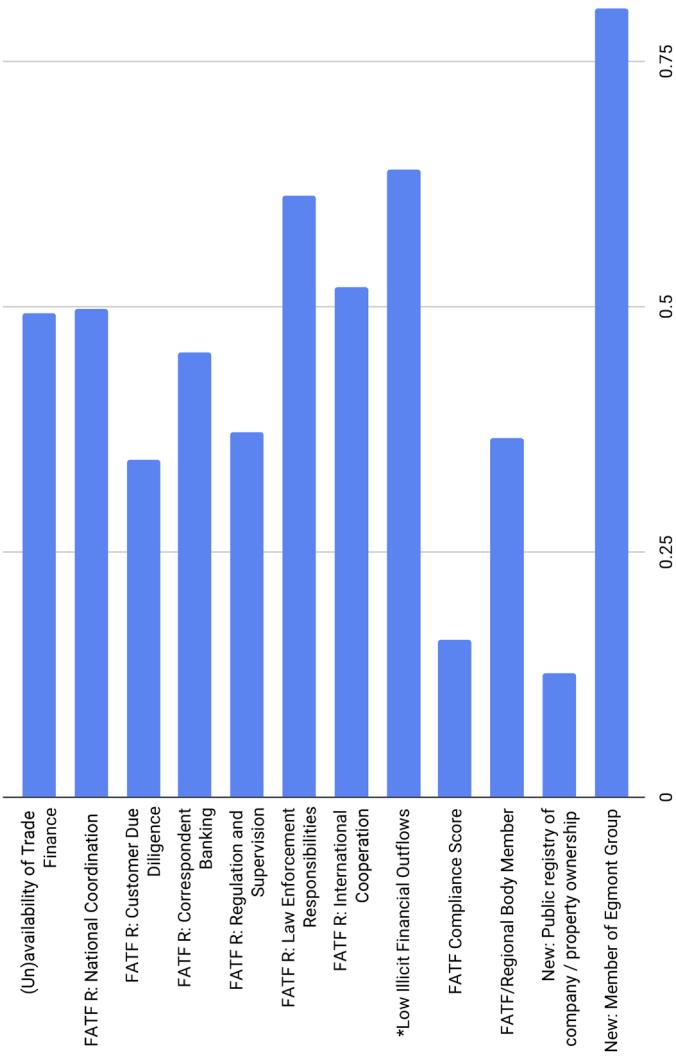


Figure 10.7. The extent to which sub-criteria making up the *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier Two as a group.

2019 Tier Two: Adequacy of Enforcement Performance Fractions

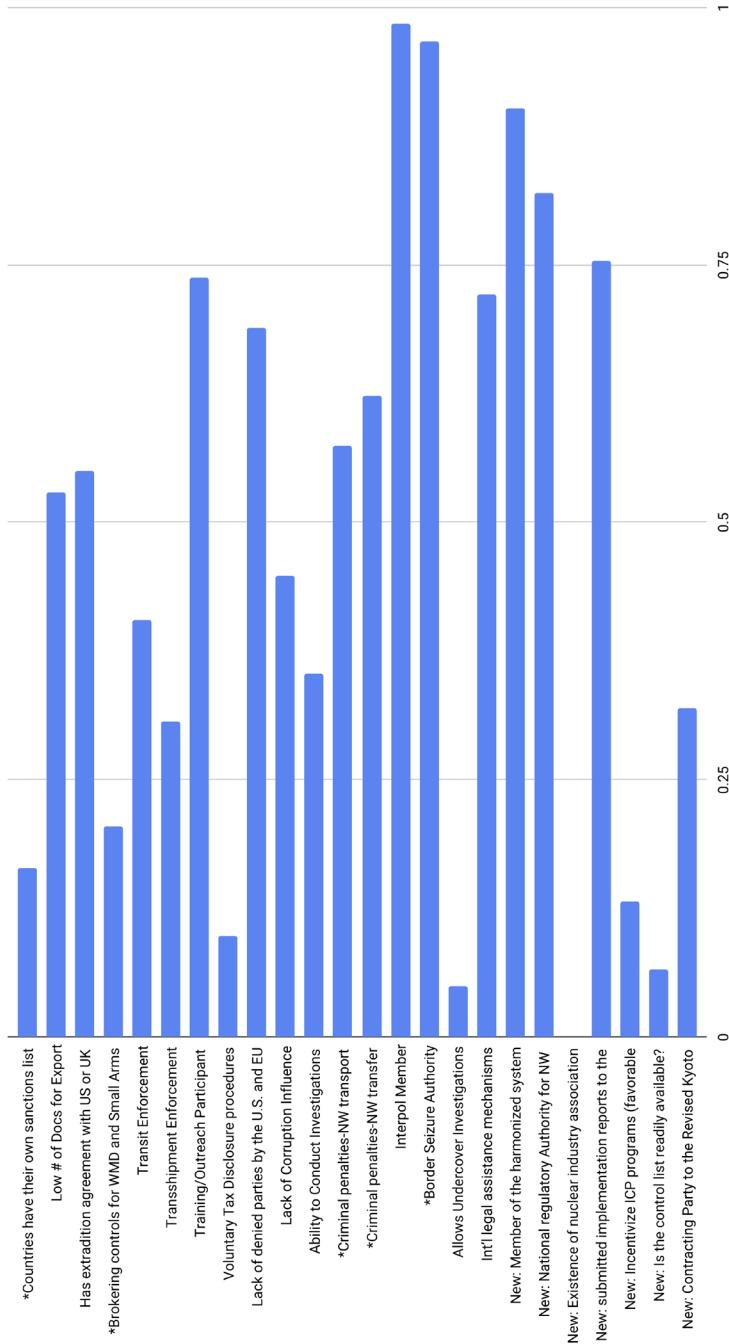


Figure 10.8. The extent to which sub-criteria making up the *Enforcement* super criterion were fulfilled by Tier Two as a group.

CHAPTER 10

TIER RANK	COUNTRY	TOTAL POINTS	TIER RANK	COUNTRY	TOTAL POINTS
1	Singapore	959	33	Algeria	460
2	Malta	873	34	Uzbekistan	452
3	Cyprus	795	35	Namibia	443
4	United Arab Emirates	783	36	Sri Lanka	443
5	Malaysia	774	37	Tanzania (United Republic of)	423
6	Moldova (Rep of the)	652	38	Venezuela (Bolivarian Republic of)	403
7	Armenia	647	39	Brunei Darussalam	398
8	Jordan	632	40	Oman	387
9	Kyrgyzstan	628	41	Nicaragua	376
10	Chile	615	42	Ethiopia	374
11	Georgia	592	43	Kuwait	373
12	Albania	590	44	Niger	363
13	Jamaica	585	45	Colombia	361
14	Saudi Arabia	583	46	Bahamas	357
15	Panama	577	47	Morocco	355
16	Bangladesh	558	48	Ecuador	343
17	Malawi	549	49	Nigeria	335
18	Zambia	547	50	Madagascar	333
19	Azerbaijan	530	51	Uganda	295
20	Mongolia	527	52	Paraguay	288
21	Costa Rica	523	53	Egypt	278
22	Ghana	518	54	Viet Nam	271
23	Thailand	511	55	Lebanon	250
24	Peru	485	56	Lao People's Democratic Republic	215
25	Tajikistan	483	57	Vanuatu	204
26	Philippines	482	58	Libya	179
27	Dominican Republic	480	59	Syrian Arab Republic	174
28	Qatar	480	60	Iraq	160
29	Bosnia & Herzegovina	478	61	Afghanistan	79
30	Tunisia	477			
31	Indonesia	475			
32	Hong Kong	463			

Table 10.1. 2019 Rank of Tier Two countries, including total points received.

NOTE

1. David Albright, Sarah Burkhard, Allison Lach, and Andrea Stricker, “52 Countries Involved in Violating UNSC Resolutions on North Korea throughout most of 2017” (Washington, D.C.: Institute for Science and International Security, March 9, 2018), http://isis-online.org/uploads/isis-reports/documents/52_Countries_Involved_in_Violating_NK_UNSC_Resolutions_in_2017_9Mar2018_Final_%281%29.pdf

CHAPTER 11

TIER THREE RANKING

Tier Three is composed of the remaining 84 countries that are not in Tiers One and Two:

Andorra, Angola, Antigua and Barbuda, Bahrain, Barbados, Belize, Benin, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Dem Rep of the), Congo (Rep of the), Cook Islands, Côte d'Ivoire, Cuba, Djibouti, Dominica, El Salvador, Equatorial Guinea, Eritrea, Fiji, Gabon, Gambia, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Holy See, Honduras, Kenya, Kiribati, Kosovo, Lesotho, Liberia, Macedonia, Maldives, Mali, Marshall Islands, Mauritania, Mauritius, Micronesia (Federation of), Montenegro, Mozambique, Myanmar, Nauru, Nepal, Niue, Palau, Palestine (State of), Papua New Guinea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Sudan, Sudan, Suriname, Swaziland, Timor-Leste, Togo, Tonga, Trinidad and Tobago, Turkmenistan, Tuvalu, Uruguay, Yemen, and Zimbabwe.

Table 11.1 (and Figure 11.1) show the rankings of the countries in Tier Three. The average score in 2019 for Tier Three is 321 points. The median is 316. Both are down from 2017, where the average points were 380 and the average median was 377.

While the strategic trade control requirements or expectations for non-supplier and non-transshipment countries may not be as high, Tier Three still performed poorly overall. The results suggest that for these countries, which comprise 42 percent of all countries, trade controls are a low priority. In general, Tier Three countries lack a basic commitment to international conventions and legislation from which to enforce trade controls.

Moreover, they lack capacity, resources, and possibly the will to combat proliferation and enforce trade controls. Prevalence of corruption in these countries, and the related ease with which illicit funds can be used, support trafficking in strategic commodities. Tier Three countries could potentially be used by unscrupulous “middlemen” or facilitators to finance and procure commodities from supplier countries. As a result, the same cutoff is used for Tier Three as for Tier Two, namely half the total points (650 points). Unfortunately, no country in Tier Three achieved these points. A score below one-third of the total possible points means that countries need to do considerable work to improve their trade control systems (68 countries). Those in between need to improve their systems somewhat (16 countries). This is visualized in the pie chart in Figure 11.2.

Although a country’s total score is the fundamental measure of the effectiveness of its trade control system, it is difficult to use it to prescribe a way for countries to improve. As a result, the performance fraction charts the extent to which countries have met the sub-criteria. For example, if the PPI assigned 0, 5, or 10 points for a country’s adherence to the Additional Protocol (0 would entail no signature or ratification, 5 would signify signature but not ratification, and 10 would signify points for full ratification), the performance fractions would assess those base points awarded to each country before weighting as low, medium, or high impact. It does not factor in any negative indicators. Performance fractions, in fact, allow for a basic assessment of where points were *not* received. Please refer back to Chapter 7: Total Weighted Score and Rank, for a longer discussion of performance fractions.

The performance fractions for Tier Three show that their low scores stem from insufficient action taken to meet the criteria. Fulfillment of only one super criterion, *Legislation*, reached 50 percent (see Figure 11.3).

TIER THREE IN THE OVERALL RANK

Compared to Tiers One and Two countries, Tier Three countries did not perform as well on fulfillment of sub-criteria and overall. None of the 84 countries were in the top 50 of all 200 countries. Fourteen Tier Three countries ranked between 50 and 100; the remaining 70 countries ranked in the bottom half of all 200 countries.

Many of the countries in Tier Three have *not* been used as transshipment countries by proliferant states in the process of illegally procuring goods or moving funds, but they factor into sanctions evading schemes of other countries. Overall, these countries appear to pose a generally lower risk of being caught up in illicit trading schemes. However, this could change as countries develop or as illicit trading networks look to exploit additional states with weak controls. Another concern is that many Tier Three countries offer a platform for international sanctions evasion, as is frequently observed in cases related to enforcement of UN sanctions on North Korea.¹

While some countries actively engage in sanctions-evading business, likely because it is a source of much-needed income, or services offered by a sanctioned party come at a cheaper price, others are vulnerable to individuals and entities on their territories engaging in sanctions evasion schemes due to their lack of oversight and regulations.

INTERNATIONAL COMMITMENT

No Tier Three country achieved two-thirds of the total possible points under this super criterion; the highest scorer received 65 percent of possible points. Twenty-eight countries, however, did receive at least half of the possible points. Forty-seven countries received between 25 and 50 percent of possible points, while the remaining nine countries received less than 25 percent.

The performance fractions under this super criterion suggest a lack of commitment to adopting international agreements and conventions (see Figure 11.4). While the great majority of Tier Three countries are parties to the three major WMD Treaties (NPT, CWC, and BWC), memberships in other important conventions such as the Convention for the Suppression of Acts of Nuclear Terrorism, the Convention on the Physical Protection of Nuclear Materials, and the Proliferation Security Initiative,

fell short of 50 percent. There is room for improvement regarding IAEA cooperation. Of all the tiers, Tier Three countries have the highest rate of participation in regional Nuclear Weapon Free Zone treaties, implying an important commitment to preventing the spread of nuclear weapons in their regions. This should not be taken as an indication that countries in Tiers One and Two lack commitment to non-proliferation. It more likely reflects the fact that, for many countries in Tiers One and Two, NWFZ treaties have not been established in their regions, for example, in Europe and the Middle East.

LEGISLATION

Seven countries received more than two-thirds of the possible points under this super criterion, with the highest, Macedonia, achieving 97 percent of possible points. The next 16 countries received at least half, but less than two-thirds, of the points, while the remaining 61, with the exception of the bottom two ranking countries (Holy See and Cook Islands), received less than half, but at least 25 percent, of possible points.

Looking at export control legislation specifically reveals that the quality of existing legislation in this tier is poor (see Chapter 3, Table 3.2, for a discussion of how quality of legislation is characterized). Only seven countries were in the Dark or Light Green category of export control legislation, and the overwhelming majority, or 82 percent, have legislation in the Orange or Red categories. Of note, the quality of export control legislation did not improve for any Tier Three country in 2019. The tier performance statistics changed, however, due to changes in the tier placement of certain countries: San Marino was moved to Tier One, and Jordan was moved to Tier Two. Both had Dark Green legislation and had lifted the average performance of Tier Three in 2017.

The following lists countries by the quality of their export control legislation, listed from higher to lower ranking:

Dark Green (4): Macedonia, Andorra, Montenegro, and Holy See

Light Green (3): Cambodia, Kosovo, and Myanmar

Yellow (8): Guatemala, Uruguay, Cuba, Sierra Leone, Botswana, Cape Verde, Rwanda, and Niue

Orange (25): Gabon, Solomon Islands, Fiji, Trinidad and Tobago, Grenada, Lesotho, Seychelles, Bolivia, El Salvador, Burkina Faso, Nauru, Mauritania, Senegal, Timor-Leste, Côte d'Ivoire, Barbados, Bhutan, Samoa, Turkmenistan, Suriname, Benin, Gambia, Saint Kitts and Nevis, Palau, and Tuvalu

Red (44): Cameroon, Bahrain, Mauritius, Antigua and Barbuda, Saint Lucia, Mali, Tonga, Angola, Honduras, Nepal, Swaziland, Kenya, Papua New Guinea, Marshall Islands, Cook Islands, Dominica, Djibouti, Saint Vincent and the Grenadines, Maldives, Guinea, Mozambique, Togo, Congo (Dem Rep of the), Congo (Rep of the), Zimbabwe, Sao Tome and Principe, Chad, Belize, Guyana, Guinea-Bissau, Comoros, Liberia, Yemen, Central African Republic, Micronesia, Kiribati, Haiti, Burundi, Eritrea, Equatorial Guinea, Sudan, Palestine, Somalia, and South Sudan

The performance fractions show that some trade control legislation exists that could support potential future nuclear commodity trade control laws (see Figure 11.5). As of 2019, relevant nuclear direct and dual-use control lists are missing in all but a handful of Tier Three countries. Several sub-criteria, such as having export licensing regulations, an investigative authority, and requiring a certain set of documents for imports, are fulfilled to more than 75 percent, but since relevant control lists are missing, these laws and authorities do not apply to many nuclear or dual-use items. For the other six sub-criteria, countries fall far short of 50 percent, with five of the sub-criteria not reaching 25 percent.

ABILITY TO MONITOR AND DETECT STRATEGIC TRADE

Similar to Tiers One and Two, Tier Three countries do not perform well overall in their *Ability to Monitor and Detect Strategic Trade*. The highest-ranking country received 56 percent of the possible points; only the top two countries achieved more than 50 percent of the possible points. The next 58 countries, while scoring below half of the total possible points, received at least a quarter of possible points, while the remaining 24 countries did not achieve 25 percent.

Performance fractions show that only three sub-criteria were fulfilled to more than 75 percent (see Figure 11.6): Using automated customs systems, being a party to the UN Convention on the Law of the Sea or

on Transit of Land-locked States, and filing export declarations electronically. As such, the performance fraction profile of Tier Three looks similar to that of Tier Two. All three sub-criteria are directly or indirectly supported and promoted by the United Nations, as discussed in the Tier Two section, showing that international organizations can help individual countries increase their ability to monitor and detect strategic trade. All other sub-criteria are fulfilled less than 50 percent. While it may take a long time to move up the ranks in a World Bank ranking, for example, other PPI sub-criteria can be met quickly, such as by providing a governmental point of contact for Resolution 1540 implementation or working with the public and industry to increase awareness of export-controlled items and often-used illicit trading schemes.

ABILITY TO PREVENT PROLIFERATION FINANCING

Tier Three countries performed the worst in preventing the financing of proliferation, with the highest-ranking country in this super criterion receiving only 55 percent of the possible points. Only the top two countries achieved more than half of the total points. The next 15 countries achieved a score between half and 25 percent of the possible points, while the following 41 countries received between zero and 25 percent of the possible points. The remaining 26 countries received negative scores and include the following, listed from higher to lower ranking: Mozambique, Chad, Cambodia, Kiribati, Comoros, Botswana, Dominica, Sierra Leone, Kenya, Micronesia, Tuvalu, Djibouti, Palestine, Central African Republic, Guyana, Rwanda, Congo (Rep of the), Congo (Dem Rep of the), Eritrea, Equatorial Guinea, Burundi, Haiti, Liberia, South Sudan, Somalia, and Myanmar. Of note, the maximum point deduction under this super criterion was reduced significantly in the 2019 version, by 45 raw points, which translates to about 145 final PPI points. Also, evaluations of nine Tier Three countries included a new FATF mutual evaluation report since the 2017 index. Yet, in Tier Three, the compliance levels achieved in the new FATF reports seem to be too low to have a noticeable, positive impact on the tier's performance fraction or average score in this super criterion. Considering these changes, the fact that so many countries still receive a negative final score is significant.

The performance fractions show that significant improvement must be made in preventing proliferation financing in Tier Three. Only one

of the sub-criteria exceeds the 50 percent fulfillment marker (see Figure 11.7).

It should be noted, however, that for many countries in Tier Three, the sub-criterion's *overall FATF compliance score* was not available from a data source used in the PPI ranking. If data were available, the performance fraction for this specific sub-criterion would likely be higher, but would still fit the trend set by the other sub-criteria. Six of the sub-criteria are based on specific FATF recommendations, and would be part of the overall FATF compliance score. Performance in these six sub-criteria is generally low, with the highest being 40 percent fulfilled (see Figure 11.7). Given these low scores, the overall FATF compliance score would be expected to be comparable to these scores, or at least not significantly greater than those sub-criteria scores.

ADEQUACY OF ENFORCEMENT

Tier Three countries, in general, lack the capacity to enforce trade controls. Only the top two countries achieved a score greater than 50 percent of the possible points. The next 41 countries received less than 50 percent, but more than 25 percent, of the points, and the remaining 41 countries received less than 25 percent. Of those, five countries or entities received negative scores under this super criterion.

Once again, the *Enforcement* performance fraction profile for Tier Three looks similar to the one for Tier Two. Satisfactory performance was achieved in three sub-criteria: not having entities on select U.S. and EU sanctions or screening lists, being a member of Interpol, and having a border seizure authority (see Figure 11.8). Of the remaining 21 sub-criteria, only one was fulfilled to more than 50 percent: being a member of the harmonized system. Tier Two countries perform significantly better in participating in training and outreach and international legal assistance mechanisms, which Tier Three countries would greatly benefit from as well. Tier Three countries should also work on submitting UNSCR 1718 (2006) implementation reports.

Tier Three countries do perform best under the sub-criterion *Lack of parties on select United States and European Union screening lists*. The great majority (69) of the countries do not have a single sanctioned entity on several select U.S. or EU sanctions and screening lists. This suggests

that these countries have, so far, not been involved with known illicit trading networks. Moreover, it could also reflect that Tier Three countries do not participate as much in global trade, or to the level that Tiers One and Two countries do.

2019 Tier Three Rank

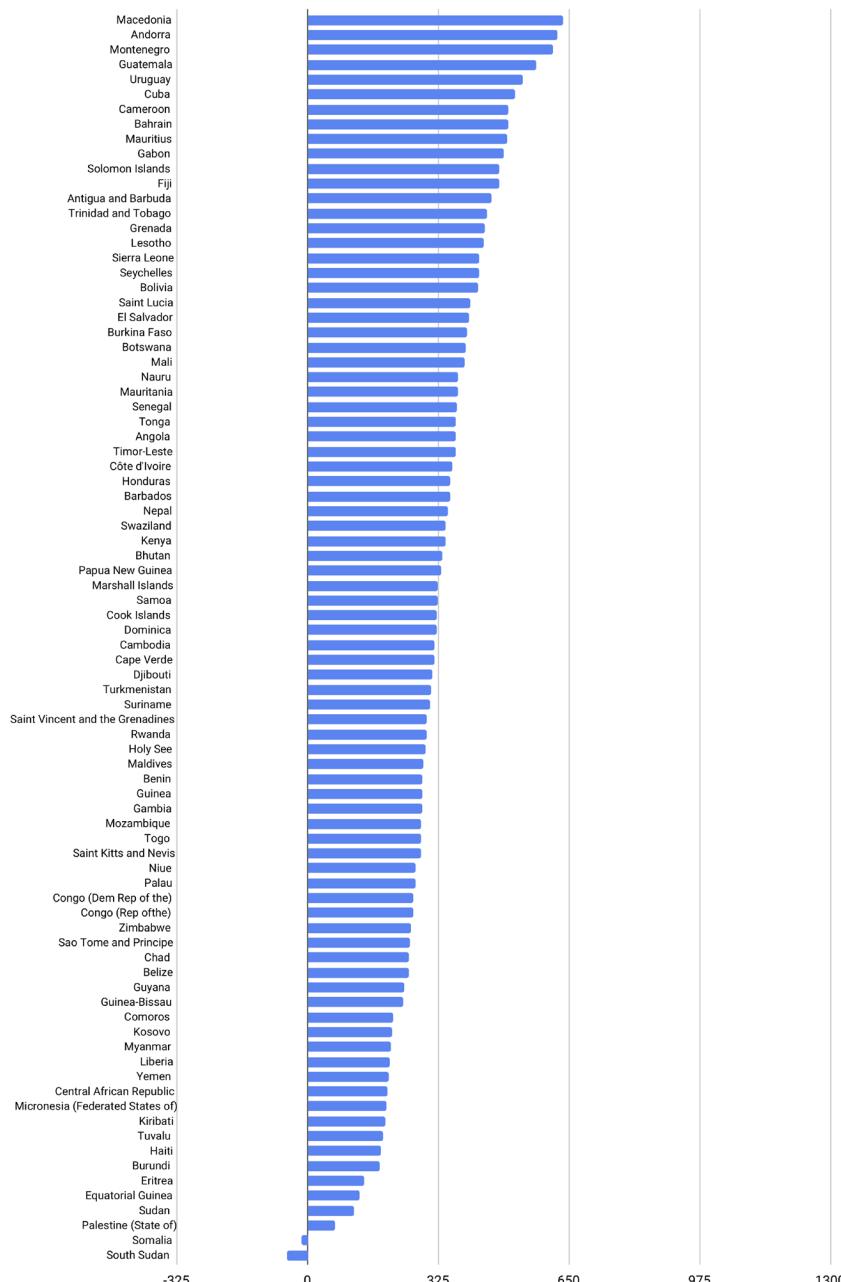


Figure 11.1. Visualization of the total points received by each country in relation to the total possible points (1,300). The scores lead to the rank. The vertical line at 650 represents the 50 percent marker, and the vertical line at 325 is the 25 percent marker.

2019 Scores of Tier Three Countries

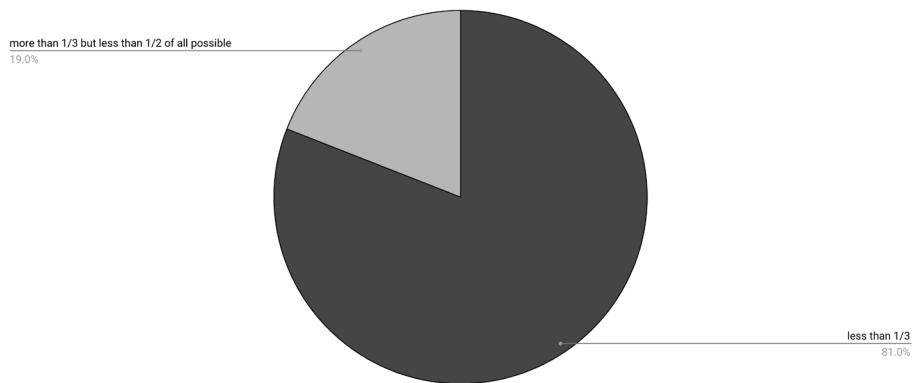


Figure 11.2. The pie chart indicates a situation that is dire. All countries need some work, but 80 percent of Tier Three countries need significant work on their trade controls.

2019 Tier Three: Comprehensive PPI Performance Fractions

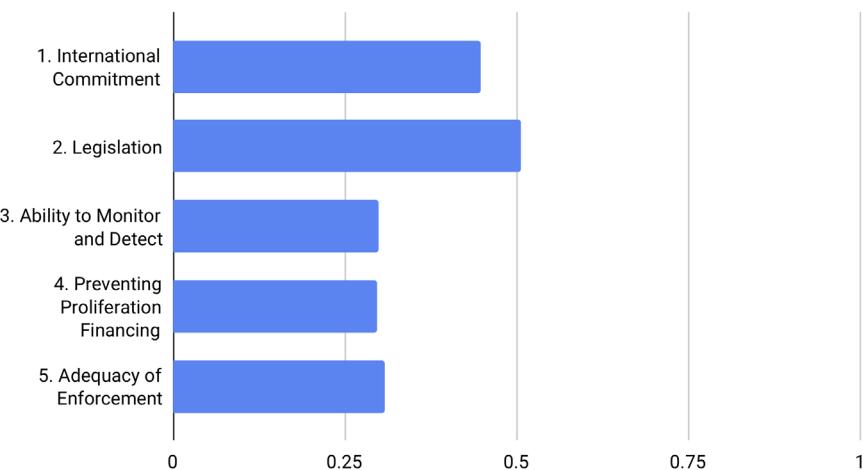


Figure 11.3. The extent to which the super criteria were fulfilled by Tier Three as a group.

2019 Tier Three: International Commitment Performance Fractions

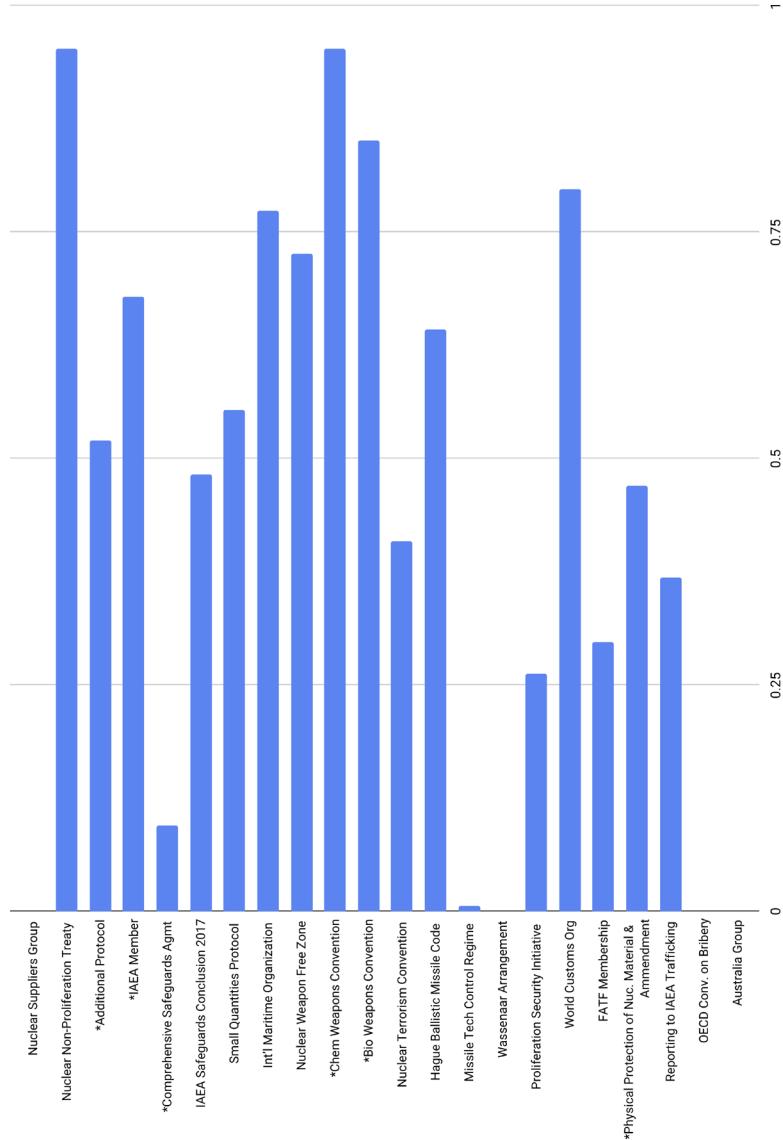


Figure 11.4. The extent to which sub-criteria making up the *International Commitment* super criterion were fulfilled by Tier Three as a group.

2019 Tier Three: Legislation Performance Fractions

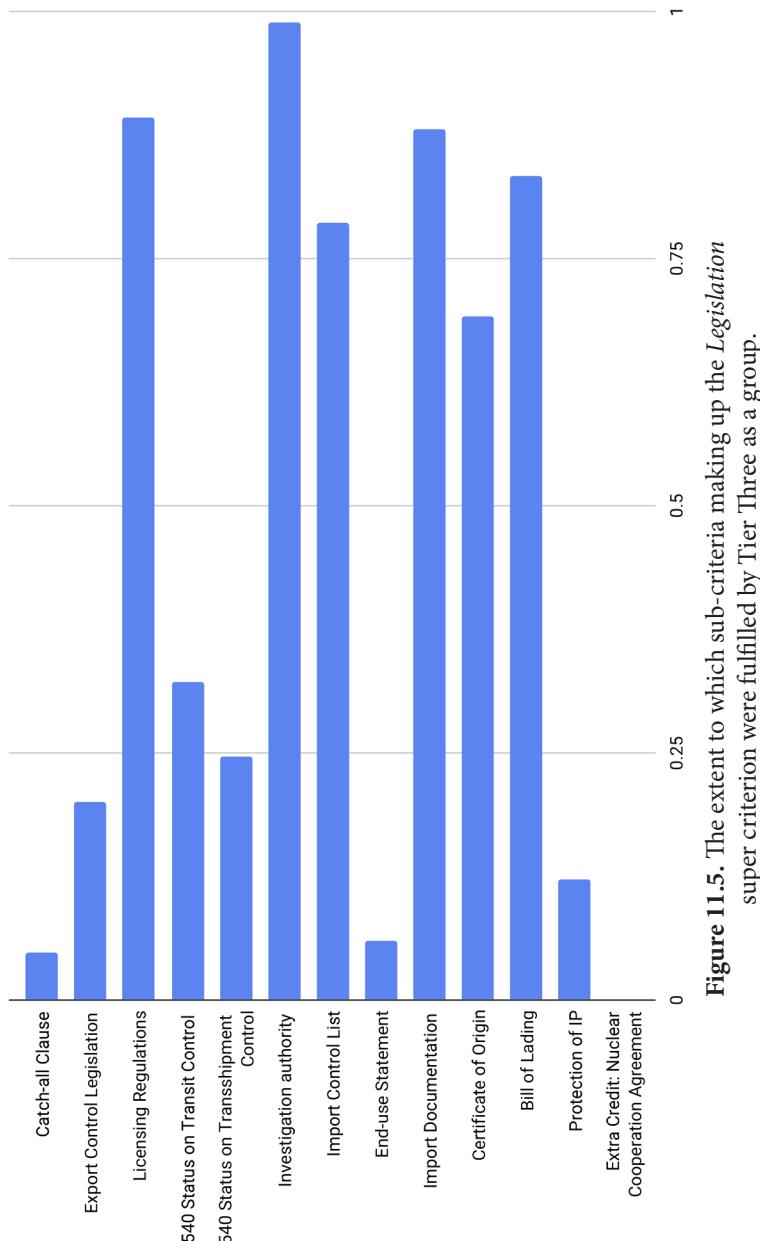


Figure 11.5. The extent to which sub-criteria making up the *Legislation* super criterion were fulfilled by Tier Three as a group.

2019 Tier Three: Ability to Monitor and Detect Strategic Trade Performance Fractions

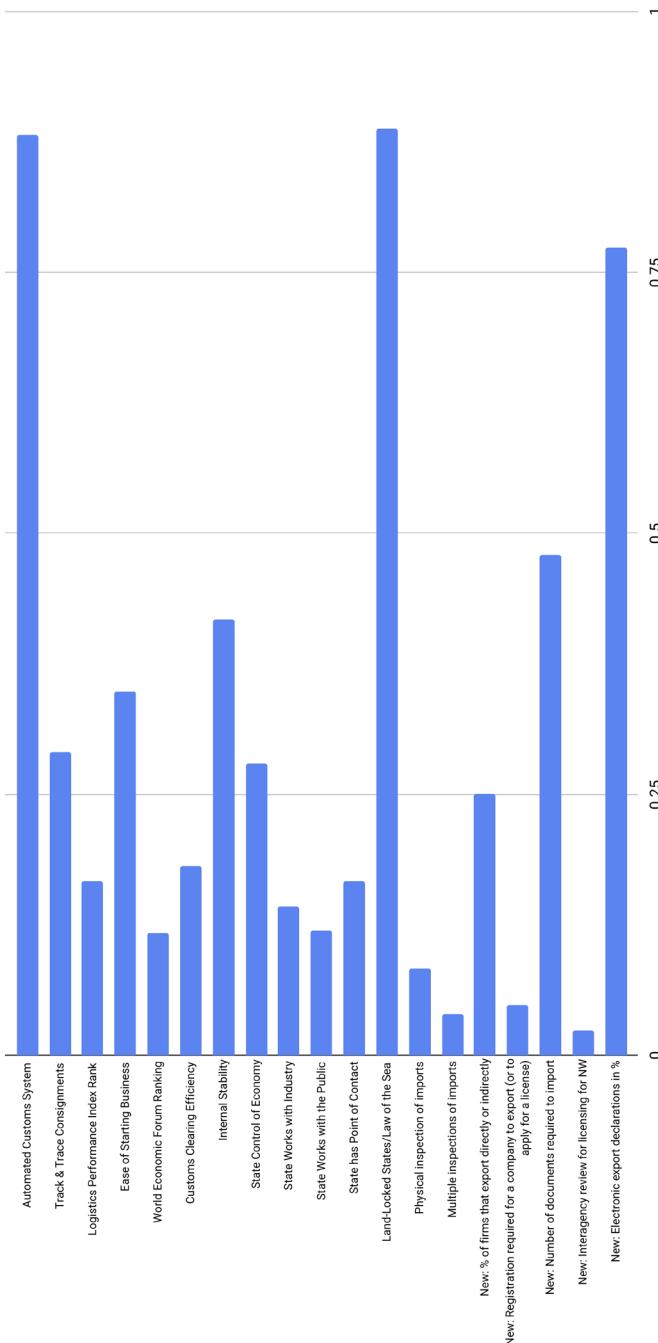


Figure 11.6. The extent to which sub-criteria making up the *Ability to Monitor and Detect Strategic Trade* super criterion were fulfilled by Tier Three as a group.

2019 Tier Three: Preventing Proliferation Financing Performance Fractions

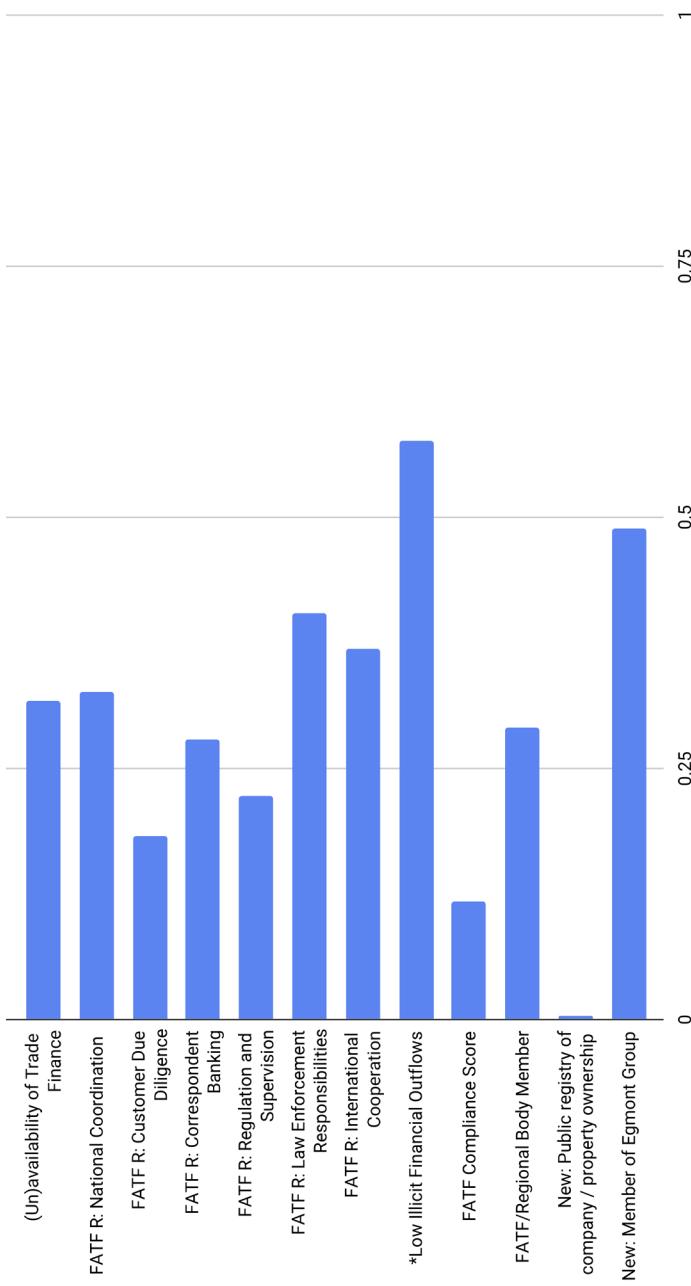


Figure 11.7. The extent to which sub-criteria making up the *Ability to Prevent Proliferation Financing* super criterion were fulfilled by Tier Three as a group.

2019 Tier Three: Adequacy of Enforcement Performance Fractions

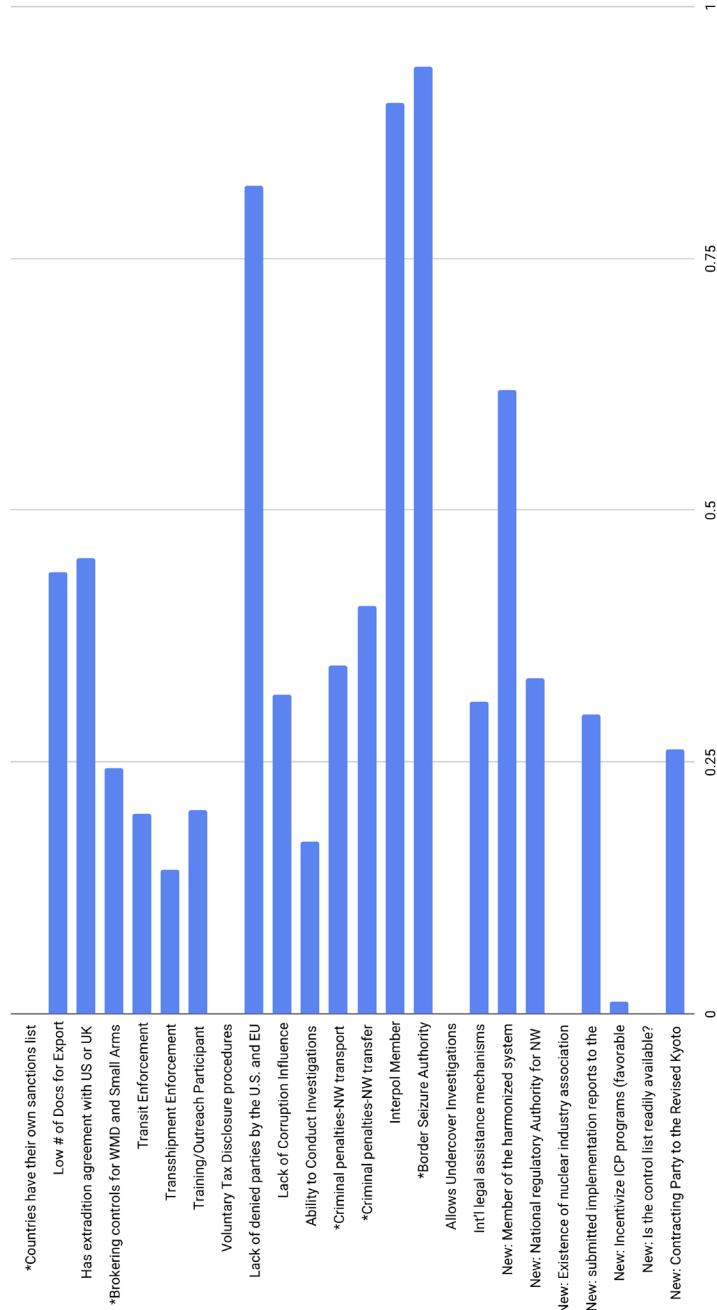


Figure 11.8. The extent to which sub-criteria making up the *Adequacy of Enforcement* super criterion were fulfilled by Tier Three as a group.

CHAPTER 11

Table 11.1. 2019 Rank of Tier Three countries, including total points received.

Tier Rank	Country	Total Points
1	Macedonia	635
2	Andorra	621
3	Montenegro	611
4	Guatemala	567
5	Uruguay	535
6	Cuba	516
7	Cameroon	499
8	Bahrain	498
9	Mauritius	497
10	Gabon	488
11	Solomon Islands	477
12	Fiji	475
13	Antigua & Barbuda	458
14	Trinidad & Tobago	447
15	Grenada	440
16	Lesotho	438
17	Sierra Leone	426
18	Seychelles	426
19	Bolivia	423
20	Saint Lucia	405
21	El Salvador	402
22	Burkina Faso	395
23	Botswana	394
24	Mali	391
25	Nauru	375
26	Mauritania	374
27	Senegal	370
28	Tonga	368
29	Angola	368
30	Timor-Leste	367
31	Côte d'Ivoire	360
32	Honduras	355
33	Barbados	354
34	Nepal	348
35	Swaziland	344

Tier Rank	Country	Total Points
36	Kenya	343
37	Bhutan	333
38	Papua New Guinea	332
39	Marshall Islands	324
40	Samoa	323
41	Cook Islands	321
42	Dominica	320
43	Cambodia	316
44	Cape Verde	314
45	Djibouti	310
46	Turkmenistan	307
47	Suriname	305
48	Saint Vincent & the Grenadines	296
49	Rwanda	295
50	Holy See*	294
51	Maldives	287
52	Benin	284
53	Guinea	284
54	Gambia	283
55	Mozambique	282
56	Togo	281
57	Saint Kitts & Nevis	280
58	Niue	268
59	Palau	268
60	Congo (Dem Rep of the)	263
61	Congo (Rep of the)	262
62	Zimbabwe	257
63	Sao Tome & Principe	254
64	Chad	250
65	Belize	250
66	Guyana	240
67	Guinea-Bissau	237

Tier Rank	Country	Total Points
68	Comoros	213
69	Kosovo*	209
70	Myanmar	206
71	Liberia	204
72	Yemen	201
73	Central African Republic	199
74	Micronesia (Federated States of)	195
75	Kiribati	192

Tier Rank	Country	Total Points
76	Tuvalu	186
77	Haiti	183
78	Burundi	179
79	Eritrea	140
80	Equatorial Guinea	130
81	Sudan	114
82	Palestine* (State of)	67
83	Somalia	-17
84	South Sudan	-51

NOTES FOR TABLE 11.1:

*The Holy See, Kosovo, and Palestine are difficult to rank because of their relatively small size and special international status.

NOTE

1. See, for example, David Albright, Sarah Burkhard, Allison Lach, and Andrea Stricker, “52 Countries Involved in Violating UNSC Resolutions on North Korea throughout most of 2017” (Washington, D.C.: Institute for Science and International Security, March 9, 2018), http://isis-online.org/uploads/isis-reports/documents/52_Countries_Involved_in_Violating_NK_UNSC_Resolutions_in_2017_9Mar2018_Final_%281%29.pdf. Sixteen out of the 52 countries highlighted in the report belong to Tier Three.

ANNEX I

FULL RANKING AND SUPER CRITERIA SCORES

ANNEX I

Table A.1. Total PPI Rank and Total Points (1,300 points possible; negative scores also possible)

PPI RANK	COUNTRY	TOTAL POINTS	PPI RANK	COUNTRY	TOTAL POINTS
1	United States of America	1019	30	Croatia	857
2	UK (Great Britain & Northern Ireland)	1018	31	Switzerland	854
3	Sweden	987	32	Norway	854
4	Germany	969	33	Bulgaria	845
5	Australia	966	34	Latvia	823
6	Singapore	959	35	Israel	821
7	Portugal	950	36	Japan	818
8	Hungary	942	37	Cyprus	795
9	Estonia	940	38	United Arab Emirates	783
10	Austria	927	39	Malaysia	774
11	Netherlands	926	40	Iceland	759
12	Slovenia	924	41	South Africa	749
13	Czech Republic	912	42	Greece	718
14	Poland	910	43	India	713
15	Ireland	908	44	Argentina	704
16	Spain	904	45	Mexico	691
17	Republic of Korea	897	46	Brazil	688
18	Belgium	897	47	Taiwan*	677
19	Slovakia	896	48	Kazakhstan	657
20	France	896	49	Moldova (Rep of the)	652
21	Denmark	894	50	Turkey	650
22	Italy	884	51	Armenia	647
23	Canada	883	52	Macedonia	635
24	New Zealand	882	53	Jordan	632
25	Lithuania	882	54	San Marino*	630
26	Romania	876	55	Kyrgyzstan	628
27	Finland	876	56	Andorra	621
28	Malta	873	57	Chile	615
29	Luxembourg	871	58	Montenegro	611
			59	Georgia	592
			60	Albania	590

PPI RANK	COUNTRY	TOTAL POINTS
61	Jamaica	585
62	Ukraine	584
63	Saudi Arabia	583
64	Liechtenstein*	583
65	Panama	577
66	Serbia	575
67	Guatemala	567
68	Bangladesh	558
69	Malawi	549
70	Zambia	547
71	Monaco*	546
72	China	537
73	Uruguay	535
74	Azerbaijan	530
75	Mongolia	527
76	Costa Rica	523
77	Ghana	518
78	Cuba	516
79	Thailand	511
80	Cameroon	499
81	Bahrain	498
82	Mauritius	497
83	Gabon	488
84	Peru	485
85	Tajikistan	483
86	Philippines	482
87	Dominican Republic	480
88	Qatar	480
89	Bosnia & Herzegovina	478
90	Solomon Islands	477
91	Tunisia	477

PPI RANK	COUNTRY	TOTAL POINTS
92	Fiji	475
93	Indonesia	475
94	Hong Kong*	463
95	Algeria	460
96	Antigua & Barbuda	458
97	Russian Federation	452
98	Uzbekistan	452
99	Trinidad & Tobago	447
100	Pakistan	444
101	Namibia	443
102	Sri Lanka	443
103	Grenada	440
104	Lesotho	438
105	Sierra Leone	426
106	Seychelles	426
107	Bolivia	423
108	Tanzania (United Republic of)	423
109	Saint Lucia	405
110	Venezuela (Bolivarian Republic of)	403
111	El Salvador	402
112	Brunei Darussalam	398
113	Burkina Faso	395
114	Botswana	394
115	Mali	391
116	Oman	387
117	Nicaragua	376
118	Nauru	375
119	Ethiopia	374
120	Mauritania	374

ANNEX I

PPI RANK	COUNTRY	TOTAL POINTS
121	Kuwait	373
122	Senegal	370
123	Tonga	368
124	Angola	368
125	Timor-Leste	367
126	Niger	363
127	Colombia	361
128	Belarus	360
129	Côte d'Ivoire	360
130	Bahamas	357
131	Honduras	355
132	Morocco	355
133	Barbados	354
134	Nepal	348
135	Swaziland	344
136	Ecuador	343
137	Kenya	343
138	Nigeria	335
139	Bhutan	333
140	Madagascar	333
141	Papua New Guinea	332
142	Marshall Islands	324
143	Samoa	323
144	Cook Islands	321
145	Dominica	320
146	Cambodia	316
147	Cape Verde	314
148	Djibouti	310
149	Turkmenistan	307
150	Suriname	305
151	Saint Vincent & the Grenadines	296

PPI RANK	COUNTRY	TOTAL POINTS
152	Rwanda	295
153	Uganda	295
154	Holy See*	294
155	Paraguay	288
156	Maldives	287
157	Benin	284
158	Guinea	284
159	Gambia	283
160	Mozambique	282
161	Togo	281
162	Saint Kitts & Nevis	280
163	Egypt	278
164	Viet Nam	271
165	Niue	268
166	Palau	268
167	Congo (Dem Rep of the)	263
168	Congo (Rep of the)	262
169	Zimbabwe	257
170	Sao Tome & Principe	254
171	Chad	250
172	Belize	250
173	Lebanon	250
174	Guyana	240
175	Guinea-Bissau	237
176	Lao People's Democratic Republic	215
177	Comoros	213
178	Kosovo*	209
179	Myanmar	206
180	Liberia	204

FULL RANKING AND SUPER CRITERIA SCORES

PPI RANK	COUNTRY	TOTAL POINTS
181	Vanuatu	204
182	Yemen	201
183	Central African Republic	199
184	Micronesia (Federated States of)	195
185	Kiribati	192
186	Tuvalu	186
187	Haiti	183
188	Libya	179
189	Burundi	179
190	Syrian Arab Republic	174

PPI RANK	COUNTRY	TOTAL POINTS
191	Iraq	160
192	Eritrea	140
193	Equatorial Guinea	130
194	Sudan	114
195	Afghanistan	79
196	Palestine* (State of)	67
197	Iran (Islamic Republic of)	49
198	Somalia	-17
199	South Sudan	-51
200	DPRK	-205

*These entities are difficult to rank because of their dependency on other countries or their non-state status.

TIER ONE RANKS AND SCORES

Table A.2. Tier One Ranks and Scaled, Weighted Super Criteria Scores (see Chapter 7)

TIER ONE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMIT- MENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRA- TEGIC TRADE	ABILITY TO PREVENT PRO- LIFERATION FINANCING	ADEQUACY OF ENFORCE- MENT
1	United States of America	1	1019	86	199	147	252	334
2	UK (Great Brit- ain & Northern Ireland)	2	1018	86	199	151	237	345
3	Sweden	3	987	90	200	142	217	338
4	Germany	4	969	90	199	140	204	336
5	Australia	5	966	96	199	137	209	325
6	Portugal	7	950	90	198	129	220	313
7	Hungary	8	942	84	197	138	183	340
8	Estonia	9	940	79	198	145	201	316
9	Austria	10	927	90	199	146	194	299
10	Netherlands	11	926	84	199	152	145	346
11	Slovenia	12	924	82	197	128	170	347
12	Czech Republic	13	912	88	198	134	142	349
13	Poland	14	910	84	197	140	142	347
14	Ireland	15	908	84	199	150	181	295
15	Spain	16	904	88	198	137	171	311
16	Republic of Korea	17	897	92	198	145	160	302
17	Belgium	18	897	88	199	149	137	325
18	Slovakia	19	896	85	198	137	196	280
19	France	20	896	84	199	146	142	325

TIER ONE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION FINANCING	ADEQUACY OF ENFORCEMENT
20	Denmark	21	894	90	199	149	136	320
21	Italy	22	884	90	197	141	138	318
22	Canada	23	883	92	183	151	167	290
23	New Zealand	24	882	96	183	131	162	309
24	Lithuania	25	882	82	197	145	148	310
25	Romania	26	876	81	195	124	188	288
26	Finland	27	876	90	200	139	118	329
27	Luxembourg	29	871	90	200	150	165	266
28	Croatia	30	857	78	194	134	146	305
29	Switzerland	31	854	90	191	148	166	259
30	Norway	32	854	88	183	137	154	292
31	Bulgaria	33	845	80	195	122	211	238
32	Latvia	34	823	83	196	131	123	291
33	Israel	35	821	53	173	119	276	199
34	Japan	36	818	92	158	145	116	308
35	Iceland	40	759	80	182	133	135	229
36	South Africa	41	749	78	198	128	107	237
37	Greece	42	718	86	196	115	173	148
38	India	43	713	68	163	133	150	200
39	Argentina	44	704	88	194	111	66	245
40	Mexico	45	691	78	179	140	148	146
41	Brazil	46	688	70	146	126	147	199

TIER ONE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION FINANCING	ADEQUACY OF ENFORCEMENT
42	Taiwan	47	677	19	282	81	93	202
43	Kazakhstan	48	657	77	160	96	106	218
44	Turkey	50	650	90	195	131	124	110
45	San Marino	54	630	44	192	64	162	167
46	Ukraine	62	584	82	167	121	194	20
47	Liechtenstein	64	583	48	167	79	112	177
48	Serbia	66	575	62	193	121	-36	235
49	Monaco	71	546	44	150	47	175	130
50	China	72	537	60	197	131	86	63
51	Russian Federation	97	452	84	193	127	94	-45
52	Pakistan	100	444	32	192	120	35	65
53	Belarus	128	360	58	175	115	105	-94
54	Iran (Islamic Republic of)	197	49	36	85	74	-115	-32
55	DPRK	200	-205	14	0	21	-110	-129

TIER TWO RANKS AND SCORES

Table A.3. Tier Two Ranks and Scaled, Weighted Super Criteria Scores (see Chapter 7)

TIER TWO RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMIT- MENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRA- TEGIC TRADE	ABILITY TO PREVENT PRO- LIFERATION STRA- TEGIC FINANCING	ADEQUACY OF ENFORCE- MENT
1	Singapore	6	959	68	191	144	256	299
2	Malta	28	873	78	198	127	176	293
3	Cyprus	37	795	70	196	107	168	253
4	United Arab Emirates	38	783	58	257	126	85	256
5	Malaysia	39	774	52	198	126	159	239
6	Moldova (Rep of the)	49	652	56	192	130	93	181
7	Armenia	51	647	56	126	130	200	135
8	Jordan	53	632	62	131	131	96	212
9	Kyrgyzstan	55	628	54	175	92	109	198
10	Chile	57	615	68	94	108	156	190
11	Georgia	59	592	58	136	106	12	280
12	Albania	60	590	56	192	101	73	168
13	Jamaica	61	585	58	143	123	41	219
14	Saudi Arabia	63	583	48	87	88	199	161
15	Panama	65	577	64	103	96	106	208
16	Bangladesh	68	558	54	138	95	110	161
17	Malawi	69	549	58	109	71	130	181
18	Zambia	70	547	50	110	101	102	185
19	Azerbaijan	74	530	60	168	111	6	186
20	Mongolia	75	527	58	106	84	106	174
21	Costa Rica	76	523	60	137	80	38	207

TIER TWO RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION FINANCING	ADEQUACY OF ENFORCEMENT
22	Ghana	77	518	56	151	106	81	125
23	Thailand	79	511	54	115	123	50	168
24	Peru	84	485	60	100	75	79	172
25	Tajikistan	85	483	54	127	66	62	174
26	Philippines	86	482	62	179	102	29	109
27	Dominican Republic	87	480	62	84	96	63	176
28	Qatar	88	480	52	103	107	74	143
29	Bosnia & Herzegovina	89	478	60	159	104	89	65
30	Tunisia	91	477	56	79	83	104	154
31	Indonesia	93	475	58	91	116	101	108
32	Hong Kong	94	463	18	140	94	150	60
33	Algeria	95	460	52	114	102	14	178
34	Uzbekistan	98	452	60	119	77	42	155
35	Namibia	101	443	50	100	91	83	119
36	Sri Lanka	102	443	48	92	77	46	180
37	Tanzania (United Republic of)	108	423	52	91	87	72	122
38	Venezuela (Bolivarian Republic of)	110	403	42	106	48	138	69
39	Brunei Darussalam	112	398	44	79	79	53	143
40	Oman	116	387	44	73	84	84	103

TIER TWO RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION	ADEQUACY OF ENFORCEMENT
41	Nicaragua	117	376	56	139	73	-25	133
42	Ethiopia	119	374	40	134	51	-13	162
43	Kuwait	121	373	58	77	82	64	92
44	Niger	126	363	52	81	72	82	76
45	Colombia	127	361	64	63	81	67	86
46	Bahamas	130	357	48	75	69	15	150
47	Morocco	132	355	60	101	76	-51	168
48	Ecuador	136	343	54	92	76	46	75
49	Nigeria	138	335	58	97	75	-18	123
50	Madagascar	140	333	60	76	81	-7	123
51	Uganda	153	295	48	91	83	4	69
52	Paraguay	155	288	60	66	74	-52	140
53	Egypt	163	278	32	127	81	49	-11
54	Viet Nam	164	271	62	122	76	-18	29
55	Lebanon	173	250	46	120	81	37	-35
56	Lao People's Democratic Republic	176	215	36	123	84	-119	91
57	Vanuatu	181	204	52	73	62	-35	52
58	Libya	188	179	64	94	47	-36	10
59	Syrian Arab Republic	190	174	34	65	61	113	-98
60	Iraq	191	160	58	83	90	-94	22
61	Afghanistan	195	79	50	83	57	-95	-16

TIER THREE RANKS AND SCORES

Table A.4. Tier Three Ranks and Scaled, Weighted Super Criteria Scores (see Chapter 7)

TIER THREE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMIT- MENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRA- TEGIC TRADE	ABILITY TO PREVENT PRO- LIFERATION FINANCING	ADEQUACY OF ENFORCE- MENT
1	Macedonia	52	635	65	169	98	181	121
2	Andorra	56	621	48	150	63	220	140
3	Montenegro	58	611	56	193	89	69	204
4	Guatemala	67	567	52	141	112	102	160
5	Uruguay	73	535	60	94	106	112	163
6	Cuba	78	516	58	113	92	101	152
7	Cameroon	80	499	48	102	68	137	145
8	Bahrain	81	498	56	81	84	152	125
9	Mauritius	82	497	50	106	77	58	206
10	Gabon	83	488	58	134	75	79	142
11	Solomon Islands	90	477	34	115	58	134	136
12	Fiji	92	475	58	106	82	123	106
13	Antigua & Barbuda	96	458	60	75	58	139	126
14	Trinidad & Tobago	99	447	44	86	93	98	126
15	Grenada	103	440	34	81	50	144	130
16	Lesotho	104	438	50	81	72	118	117
17	Sierra Leone	105	426	40	140	86	-19	181
18	Seychelles	106	426	54	98	49	92	133
19	Bolivia	107	423	40	132	65	31	155
20	Saint Lucia	109	405	48	100	53	65	138

TIER THREE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION FINANCING	ADEQUACY OF ENFORCEMENT
21	El Salvador	111	402	60	135	58	3	146
22	Burkina Faso	113	395	50	106	73	8	158
23	Botswana	114	394	46	126	86	-13	148
24	Mali	115	391	52	95	64	38	142
25	Nauru	118	375	32	90	32	99	122
26	Mauritania	120	374	58	83	71	43	119
27	Senegal	122	370	54	85	79	91	61
28	Tonga	123	368	38	67	76	117	71
29	Angola	124	368	50	75	57	125	60
30	Timor-Leste	125	367	32	106	49	53	126
31	Côte d'Ivoire	129	360	56	83	68	7	145
32	Honduras	131	355	50	112	60	10	124
33	Barbados	133	354	36	81	36	92	109
34	Nepal	134	348	34	78	71	68	97
35	Swaziland	135	344	44	100	50	6	144
36	Kenya	137	343	58	78	90	-24	141
37	Bhutan	139	333	24	98	67	60	84
38	Papua New Guinea	141	332	44	67	66	72	84
39	Marshall Islands	142	324	46	50	43	94	90
40	Samoa	143	323	42	106	61	25	89
41	Cook Islands	144	321	28	33	32	199	28

TIER THREE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMIT- MENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRA- TEGIC TRADE	ABILITY TO PREVENT PRO- LIFERATION FINANCING	ADEQUACY OF ENFORCE- MENT
42	Dominica	145	320	42	92	54	-15	148
43	Cambodia	146	316	58	102	91	-5	71
44	Cape Verde	147	314	34	88	62	29	102
45	Djibouti	148	310	54	100	55	-32	133
46	Turkmenistan	149	307	62	65	34	24	122
47	Suriname	150	305	30	81	64	8	122
48	Saint Vincent & the Grenadines	151	296	42	75	53	22	103
49	Rwanda	152	295	46	94	93	-39	102
50	Holy See	154	294	38	42	35	133	47
51	Maldives	156	287	32	67	68	15	105
52	Benin	157	284	40	67	72	73	32
53	Guinea	158	284	38	75	64	43	64
54	Gambia	159	283	44	73	56	53	57
55	Mozambique	160	282	54	86	72	-3	73
56	Togo	161	281	48	92	64	38	40
57	Saint Kitts & Nevis	162	280	40	73	48	19	100
58	Niue	165	268	20	63	22	117	47
59	Palau	166	268	44	65	28	69	62
60	Congo (Dem Rep of the)	167	263	52	126	96	-45	35
61	Congo (Rep of the)	168	262	46	92	73	-44	97

TIER THREE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMIT- MENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRA- TEGIC TRADE	ABILITY TO PREVENT PRO- LIFERATION FINANCING	ADEQUACY OF ENFORCE- MENT
62	Zimbabwe	169	257	40	76	69	71	1
63	São Tome & Príncipe	170	254	30	75	63	5	81
64	Chad	171	250	34	76	53	-3	90
65	Belize	172	250	42	58	50	15	84
66	Guyana	174	240	42	67	48	-38	122
67	Guinea-Bissau	175	237	42	75	63	23	34
68	Comoros	177	213	50	58	54	-11	62
69	Kosovo	178	209	6	77	55	1	70
70	Myanmar	179	206	40	94	54	-92	110
71	Liberia	180	204	40	78	78	-69	77
72	Yemen	182	201	50	58	41	65	-13
73	Central African Republic	183	199	46	75	45	-38	71
74	Micronesia (Federated States of)	184	195	10	92	36	-32	90
75	Kiribati	185	192	30	67	36	-11	71
76	Tuvalu	186	186	24	73	19	-32	102
77	Haiti	187	183	46	75	53	-62	71
78	Burundi	189	179	44	84	66	-57	43
79	Eritrea	192	140	26	50	40	-45	69
80	Equatorial Guinea	193	130	28	58	49	-57	52

TIER THREE RANK	COUNTRY	PPI RANK	TOTAL POINTS	INT'L COMMITMENT	LEGISLATION	ABILITY TO MONITOR & DETECT STRATEGIC TRADE	ABILITY TO PREVENT PROLIFERATION FINANCING	ADEQUACY OF ENFORCEMENT
81	Sudan	194	114	40	58	68	17	-69
82	Palestine (State of)	196	67	24	58	45	-37	-22
83	Somalia	198	-17	24	58	27	-80	-46
84	South Sudan	199	-51	6	58	38	-80	-74

MAPS SUMMARIZING PPI SCORES AND LEGISLATION CATEGORIES

The following two global maps illustrate the PPI country scores overall and the categories for export control legislation. The first map represents the country scores for all 200 countries, territories, and entities by blue shading, where a darker shade represents a higher score (see table A.1). The second map shows the legislative color categories defined in Chapter 3, where in brief: **Dark Green**- legislation is comprehensive; **Light Green**- legislation is somewhat comprehensive; **Yellow**- legislation is deficient; **Orange**- legislation has serious deficiencies; and **Red**- legislation is non-existent or severely deficient.

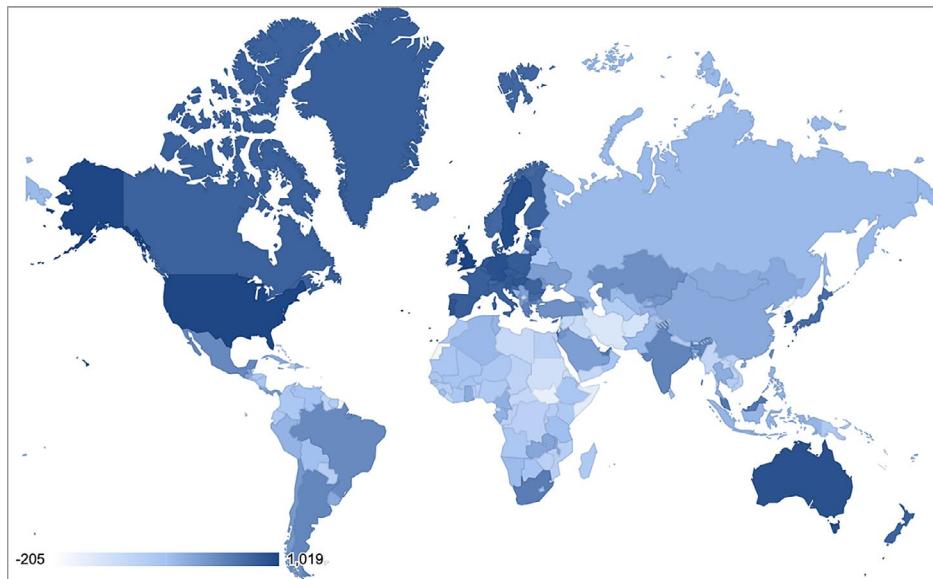


Figure A.1. The strength of trade control systems around the world, according to the 2019 PPI.

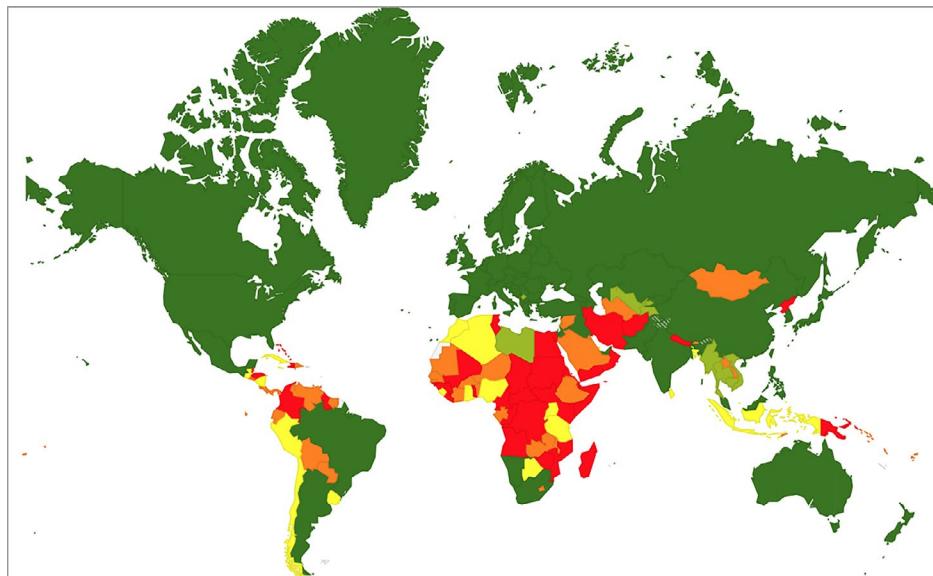


Figure A.2. World map indicating export control legislation color categories.

The legislation color key described qualitatively and in brief is: **Dark Green**- legislation is comprehensive; **Light Green**- legislation is somewhat comprehensive; **Yellow**- legislation is deficient; **Orange**- legislation has serious deficiencies; and **Red**- legislation is non-existent or severely deficient. See Chapter 3 for more on these legislative categories.

ANNEX II

RANKING BY CLUSTER ANALYSIS

CLUSTER ONE

RANK	COUNTRY	POINTS
1	United States	1019
2	United Kingdom	1018
3	Sweden	987
4	Germany	969
5	Australia	966
6	Singapore	959
7	Portugal	950
8	Hungary	942
9	Estonia	940
10	Austria	927
11	Netherlands	926
12	Slovenia	924
13	Czech Republic	912
14	Poland	910
15	Ireland	908
16	Spain	904
17	Republic of Korea	897
18	Belgium	897
19	Slovakia	896
20	France	896

RANK	COUNTRY	POINTS
21	Denmark	894
22	Italy	884
23	Canada	883
24	New Zealand	882
25	Lithuania	882
26	Romania	876
27	Finland	876
28	Malta	873
29	Luxembourg	871
30	Croatia	857
31	Switzerland	854
32	Norway	854
33	Bulgaria	845
34	Latvia	823
35	Israel	821
36	Japan	818
37	Cyprus	795
38	United Arab Emirates	783
39	Malaysia	774
40	Iceland	759
41	South Africa	749

CLUSTER TWO

RANK	COUNTRY	POINTS
42	Greece	718
43	India	713
44	Argentina	704
45	Mexico	691
46	Brazil	688
47	Taiwan	677
48	Kazakhstan	657
49	Moldova	652
50	Turkey	650
51	Armenia	647
52	Macedonia	635
53	Jordan	632
54	San Marino	630
55	Kyrgyzstan	628
56	Andorra	621
57	Chile	615
58	Montenegro	611
59	Georgia	592
60	Albania	590
61	Jamaica	585
62	Ukraine	584
63	Saudi Arabia	583
64	Liechtenstein	583
65	Panama	577
66	Serbia	575
67	Guatemala	567
68	Bangladesh	558
69	Malawi	549
70	Zambia	547

RANK	COUNTRY	POINTS
71	Monaco	546
72	China	537
73	Uruguay	535
74	Azerbaijan	530
75	Mongolia	527
76	Costa Rica	523
77	Ghana	518
78	Cuba	516
79	Thailand	511
80	Cameroon	499
81	Bahrain	498
82	Mauritius	497
83	Gabon	488
84	Peru	485
85	Tajikistan	483
86	Philippines	482
87	Dominican Republic	480
88	Qatar	480
89	Bosnia & Herzegovina	478
90	Solomon Islands	477
91	Tunisia	477
92	Fiji	475
93	Indonesia	475
94	Hong Kong	463
95	Algeria	460
96	Antigua & Barbuda	458

CLUSTER THREE

RANK	COUNTRY	POINTS
97	Russian Federation	452
98	Uzbekistan	452
99	Trinidad & Tobago	447
100	Pakistan	444
101	Namibia	443
102	Sri Lanka	443
103	Grenada	440
104	Lesotho	438
105	Sierra Leone	426
106	Seychelles	426
107	Bolivia	423
108	Tanzania	423
109	Saint Lucia	405
110	Venezuela	403
111	El Salvador	402
112	Brunei Darussalam	398
113	Burkina Faso	395
114	Botswana	394
115	Mali	391
116	Oman	387
117	Nicaragua	376
118	Nauru	375
119	Ethiopia	374
120	Mauritania	374
121	Kuwait	373
122	Senegal	370
123	Tonga	368
124	Angola	368
125	Timor-Leste	367
126	Niger	363
127	Colombia	361
128	Belarus	360
129	Côte d'Ivoire	360
130	Bahamas	357
131	Honduras	355
132	Morocco	355
133	Barbados	354

RANK	COUNTRY	POINTS
134	Nepal	348
135	Swaziland	344
136	Ecuador	343
137	Kenya	343
138	Nigeria	335
139	Bhutan	333
140	Madagascar	333
141	Papua New Guinea	332
142	Marshall Islands	324
143	Samoa	323
144	Cook Islands	321
145	Dominica	320
146	Cambodia	316
147	Cape Verde	314
148	Djibouti	310
149	Turkmenistan	307
150	Suriname	305
151	Saint Vincent & the Grenadines	296
152	Rwanda	295
153	Uganda	295
154	Holy See	294
155	Paraguay	288
156	Maldives	287
157	Benin	284
158	Guinea	284
159	Gambia	283
160	Mozambique	282
161	Togo	281
162	Saint Kitts & Nevis	280
163	Egypt	278
164	Viet Nam	271
165	Niue	268
166	Palau	268
167	Congo (Dem Rep of the)	263
168	Congo (Rep of the)	262

CLUSTER FOUR

RANK	COUNTRY	POINTS
169	Zimbabwe	257
170	Sao Tome & Principe	254
171	Chad	250
172	Belize	250
173	Lebanon	250
174	Guyana	240
175	Guinea-Bissau	237
176	Laos	215
177	Comoros	213
178	Kosovo	209
179	Myanmar	206
180	Liberia	204
181	Vanuatu	204
182	Yemen	201
183	Central African Republic	199
184	Micronesia	195

RANK	COUNTRY	POINTS
185	Kiribati	192
186	Tuvalu	186
187	Haiti	183
188	Libya	179
189	Burundi	179
190	Syrian Arab Republic	174
191	Iraq	160
192	Eritrea	140
193	Equatorial Guinea	130
194	Sudan	114
195	Afghanistan	79
196	Palestine	67
197	Iran	49
198	Somalia	-17
199	South Sudan	-51
200	DPRK	-205

